MUNICIPAL JOURNAL

ISSUED WEEKLY

VOLUME XLIV
No. 23

June 8, 1918

$3.00 a Year
10 Cents a Copy

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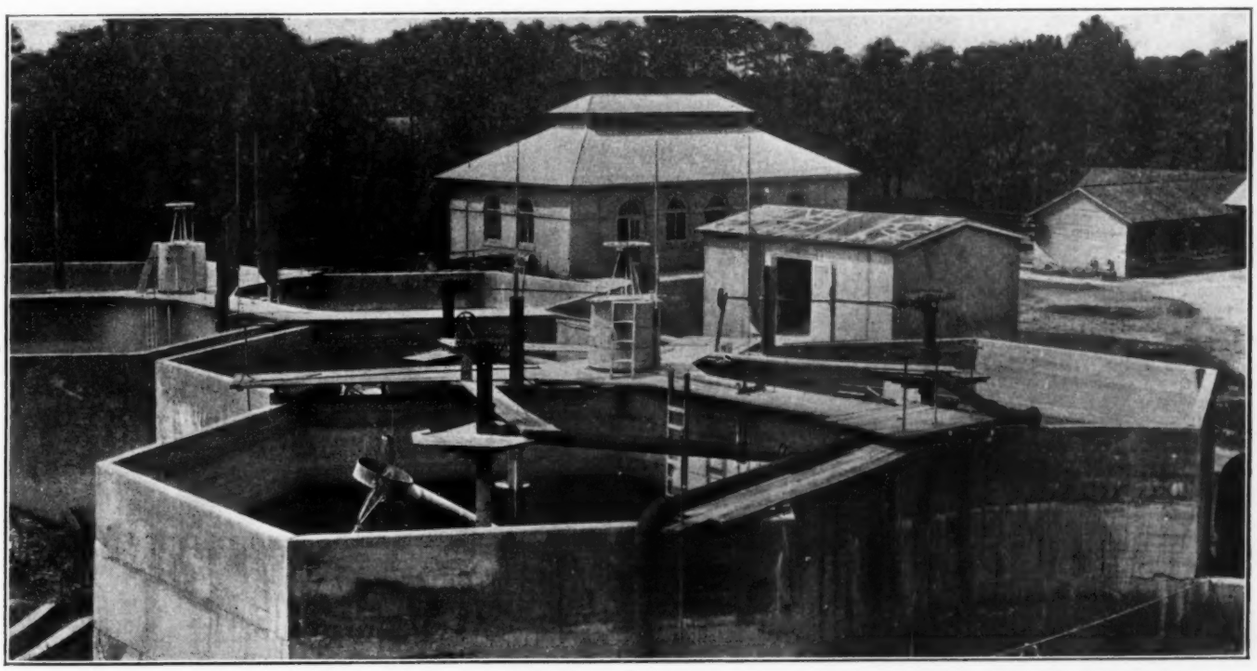
Municipal Journal

Volume XLIV. NEW YORK, JUNE 8, 1918 No. 23

WATER SOFTENING AT DAYTONA, FLORIDA

Treating a Purely Domestic Supply to Effect Economy and Improve Acceptableness—Description of Plant—Theory of Operation—Determining Amount of Lime Needed—After-Precipitation in Mains—Cost

By GEORGE A. MAIN *



GENERAL VIEW OF RESERVOIRS, STOCK HOUSE, AND, IN THE BACKGROUND, THE NEW DISPOSAL PLANT.

The business of the waterworks at Daytona, Florida, is the production and distribution of a domestic supply of water only, the city containing practically no industries. Conservation being the nation-wide watchword at this time, it is peculiarly fitting to reconsider whether the water used in the households of any city is such as to require an enormous daily waste of soap because of its hardness, or to cause injury to linens by the minerals it carries; and if it is, to estimate whether money spent in eliminating the objectional qualities may not be true economy.

Water softening for Daytona was first suggested to the speaker by Dr. Monfort, chemist, of St. Louis, at the annual convention of the American Waterworks Association held at New Orleans in 1910. The writer gratefully acknowledges Daytona's indebtedness to Dr. Monfort, and only hopes that this description of Daytona's experience may result, as did Dr. Monfort's advice, in the adoption by at least one city of a policy of permanently and economically improving the quality of its water supply.

Type of Softening Plant.—Fundamentally, water softening is the process of thoroughly stirring raw water and chemicals together, and allowing the mixture to clarify by the settling of the precipitate. This may be accomplished in separate vessels, in which the water is wholly at rest after agitation is completed, the several basins being alternately and intermittently recharged, which type is called the intermittent type. In contrast to this type is the continuous type of softener, in which the water is always in motion as it passes through the softener, the motion of the water during its self-imposed agitation being quite rapid, but during the completion of the process, the settling, the velocity being greatly reduced by increased cross-sectional area of the conveying channel. There were several small industrial soft-

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eners of both types in Florida when we took up the question of type and design, but there were then (in 1910), we believe, no municipal softeners.

Correspondence with officials at New Orleans, Columbus and Oberlin, Ohio, McKeesport, Pa., and Winnipeg, Canada, and some reading of works on the subject, showed us that the intermittent type was best adapted to our particular character of water, to our flowing artesian supply, and to our intermittent pumpage, all of which bear directly on the type and design.

Design and Operation.—Briefly, the Daytona softening plant, which was doubled in capacity in 1917, is composed of six reinforced concrete settling tanks, hexagonal in shape in order that three may fit together as a unit, thirteen and one-half feet deep, thirty-six feet in diameter, and having a capacity of 90,000 gallons each. The capacity of the plant may be increased indefinitely by the addition of more similar units.

The familiar hydrogen sulphide gas is present in our raw water, as it is in most Florida flowing well waters. To accomplish the removal of this gas by aeration, the gas-laden water is discharged into the tanks through the center of floats, connected by flexible piping with the well water supply, thus always discharging at the *surface* of the water, rather than underneath the body of water as would be the case were the flow direct into the bottom of the tanks. The strength of the well-flow decreases as the tank fills up, the flow entirely ceasing when the water stands at the level of the static head of the well, the depth of the tanks being determined by the well head at Daytona.

Accurately calibrated float gages indicate the quantity of raw water which has entered the tanks, and hence furnish the basis for computing the weights of chemicals. A forty-inch slide rule on the wall of the lime room enables the operator to compute at a glance the amount either of lime or of soda required for any given quantity of raw water, adjustable pointers on the slide indicating directly the correct amounts.

We are now using hydrated lime only, 2.75 pounds per one thousand gallons. Our permanent hardness is very low, only requiring one-sixth of a pound per one thousand gallons of the soda ash. The advantage in softness resulting from this small dose of soda ash is so small that its use was discontinued a year or so ago. The lime is weighed out and made into a strong whitewash in two cypress mixing tanks placed at the junction of the three reservoirs, forming a unit.

Thorough agitation of the raw water after the chemicals have been added is a very essential part of the softening process. The agitation at this plant is obtained by compressed air at 15 pounds pressure delivered through 3/32-inch orifices in pipes laid on the bottoms of the mixing and settling tanks. This air agitation was suggested by a similar method of agitation in use at the E. O. Painter fertilizer works of Daytona. The orifices are spaced about four feet apart each way. Air agitation is begun as soon as the tank is full of raw water.

The lime mixture from the cypress tank is then run into the settling tank and the agitation continued for an hour, after which the air is shut off and the water allowed to settle and clarify. Experiments proved that reaction and precipitation continued in softened water for several days, although most of the precipitation is completed in a few hours; consequently, water for use is always drawn from the tank that has been settling the longest.

The clarified water is discharged through a pipe with a flexible joint so arranged that the suction end of the pipe is above the water during the agitation and settling of the water that is being softened. When it is desired to draw water from any tank, the suction end of the discharge line is allowed to settle into the water and is suspended near the surface by floats so as to continually remove the upper layer of water, which is that most thoroughly settled.

A circular clear-water basin of brick and having a capacity of 46,000 gallons receives the purified water from all of the settling tanks, and from this clear water basin the water is pumped to an elevated steel tank and into the distribution system.

The lime in precipitating carries down with it such other impurities as may be in suspension in the water. About once each month the accumulated sludge in the tanks is drawn off and discharged by centrifugal pumps to the river banks at the southern limits of the city. The quantity of this sludge is approximately twice as great as the amount of lime put into the water.

Analytical Control of the Softening.—The quality of the softened water depends upon the correct determination of the amount of chemicals required per thousand gallons, upon the care exercised in computing and weighing the chemicals, and upon the length of time and thoroughness of the mixing and the length of time the water is allowed to settle. The temperature also affects the result.

In determining the correct amount of lime, an examination is made of the purified water, not of the raw water, as would be done by an analytical chemist. Advantage is taken of the direct relation between temporary hardness and alkalinity, and the dose of lime is proportioned to the alkalinity of the water. Alkalinity plays so important a part in the softening process itself, as well as in the chemical examination of the water, that special knowledge of alkalinity is essential to the informed softening plant operator who has to soften water having a temporary hardness.

There are three distinct kinds of alkalinity—bicarbonate, carbonate, and hydrate—readily distinguished the one from the other by their different characteristics, particularly by the differences in their degrees of solubility and the differences in their effect upon the colors of two organic chemicals used as indicators and so designated. These three kinds of alkalinities are exemplified by three forms of lime found nearly everywhere. Calcium bicarbonate is the alkaline lime found in our well waters. Calcium carbonate is one product of air slaked lime. Calcium hydrate is water slaked lime. Calcium carbonate or air slaked lime differs from the other two forms in that it is practically insoluble in pure water. Calcium hydrate differs from the bicarbonate in that it has an extremely pungent taste, while the bicarbonate in well waters is quite tasteless. Softening of water containing bicarbonate of lime is simply the process of transforming the soluble calcium bicarbonate into insoluble carbonate, when the insoluble carbonate, being in suspension, settles to the bottom of the container, leaving the water free from the lime. This change from the bicarbonate to the carbonate is produced by the addition of hydroxide to an amount equivalent to that of the bicarbonate present. If less hydroxide is added, the water will still be of a bicarbonate alkalinity, and if more is added the water will be of a hydrated alkalinity, the excess of lime that is added remaining in the water and to that extent re-hardening it. The carbonate of lime, although relatively insoluble, is slightly soluble, and to the extent of its solubility it of course remains in the water after the process. The softened water will therefore contain carbonates only, carbonates and bicarbon-

ates, or carbonates and hydrates. It can contain only two kinds, as the bicarbonate and the hydrate cannot both remain in the water at the same time since they react and form the carbonate with a certain amount of whichever of the two forms was in excess.

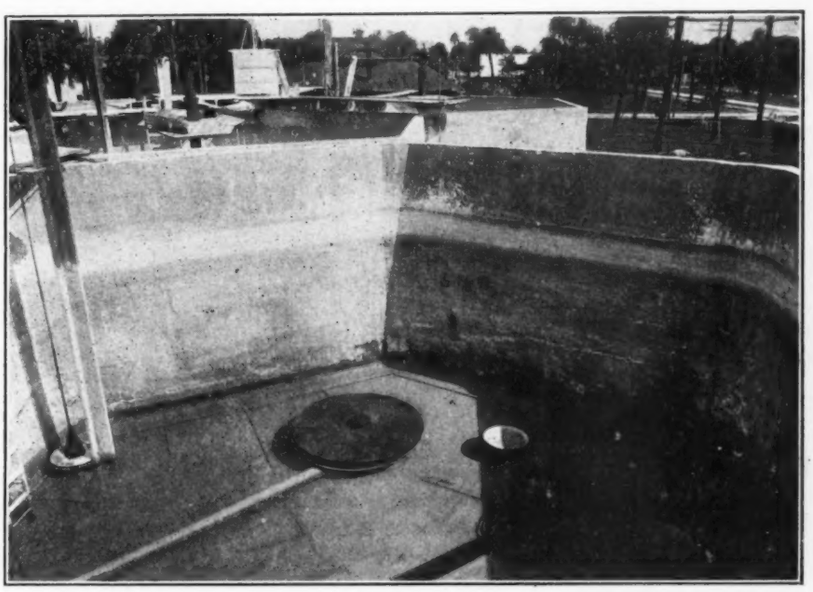
To determine the correctness of the lime adjustment, it is necessary only to ascertain which of the two alkalinities is present and in what proportion. Methyl orange and phenolphthalein are used as chemical indicators. The former possesses the property of being yellow in the presence of any alkaline water, but turns to faint pink after the water is made acid. Phenolphthalein, on the other hand, is colorless in the presence of an acid and also in the presence of bicarbonates, but assumes a red tint in the presence of either of the other two alkalinities; furthermore, the red color of the tested water disappears when sufficient acid is added to neutralize one-half of the alkalinity when carbonates only are present.

If now an acid solution of known strength be added very slowly to a measured quantity of water to which has previously been added a drop of the Methyl orange indicator, and if the amount of acid solution required to change the color from the alkaline yellow to the acid-indicating pink be carefully noted, the total alkalinity of the water may be computed readily. Similarly, the neutralization point between alkalinity and acidity to the phenolphthalein indicator may be ascertained. From these two values, the alkalinity as indicated by Methyl orange (usually abbreviated to "M") and the alkalinity as indicated by phenolphthalein (usually abbreviated to "P"), the kinds of alkalinities present in the water and their respective amounts may be computed readily, by formulas. The values of "M" and "P" are usually expressed in cubic centimeters. If P is zero, bicarbonates only are present in the sample of water and their quantity is indicated by the value of M. If P equals ½M, carbonates only are present and the quantity is indicated by M. If P is less than ½M, 2P measures the carbonates and M minus 2P measures the bicarbonates. If P is greater than ½M, 2M minus P indicates the carbonates and M minus the carbonates equals the hydrates.

The softest water is that showing the lowest total alkalinity. This minimum of alkalinity is not reached, as might be supposed, when the bicarbonates in the raw water are exactly neutralized by the applied hydrates, that is, when the sample gives M just twice as great as P, but rather when a slight excess of hydrates is added which has the effect of reducing the carbonates to a greater extent than the excess of hydrates added. The pungent, flat taste resulting from this hydrate alkalinity, however, is an objection to reducing the water to the absolute minimum hardness in the case of a domestic water supply, and the plan in Daytona is to maintain a slight alkalinity on the bicarbonate side of the neutral rather than on the hydrate side.

The method described for determining the correct amount of lime to be added to remedy temporary hardness is applicable also to the adjustment of the soda ash for permanent hardness. By starting with a known shortage of soda ash and gradually increasing the dose in the softening process until a sample of softened water shows an increase of carbonate alkalinity, the correct proportion of soda ash is ascertained. The acid solution usually used for these tests is a very weak solution of hydrochloric acid of known strength, which is applied to the sample from a graduated tube or burette.

After-Precipitation of Calcium Carbonate in Water Mains. Although practically all the precipitation occurs in the settling tanks within a few hours after the softening precess is performed, a very slight precipitation continues for about a week. Since it would be impracticable to provide settling tanks of sufficient capacity to allow a week's settling, a slight after-precipitation in elevated tanks, mains, service pipes, meters, and house pipes is unvoidable. The quantity of deposit thus left in the distribution system is about the same as that left by the hard water before the installation of the softening plant. The raw water, however, formed a hard scale which was very difficult to remove from the meters, while the precipitated carbonate is very easily removed. After-precipitation, therefore, is not a serious argument against softening. This after-precipitation could no doubt be abated by the application to the purified water of sufficient carbon dioxide gas to return part or all of the carbonate which remains in solution and suspension to the soluble bicarbonate. However, we have not tried this somewhat recent idea and are not yet convinced that the advantage would not be nearly or quite offset by resulting disadvantages and cost.



VIEW OF THE WORKING PARTS OF ONE OF THE UNITS.

CONCLUSIONS.

Water softening is water purification. Not only are undesirable mineral matters removed by this, the Porter-Clark, softening process, but suspended matter and even bacteria, where they exist, are also removed by the entangling and filtering effect of the slowly settling precipitate. Softened water is a healthful water, pleasant to the eye, to the skin, and to the taste.

The cost of the Daytona plant, to date, is about $10,-145, approximately 10 per cent. of the cost of the water works. The unit cost of softening, per thousand gallons, is about three cents, which includes lime, operating attendance, repairs, depreciation, and interest on the investment in softening plant.

No increase in water rates was made however, on

account of the additional cost of operating the softening plant. On the contrary, the increases in the number of water patrons has so reduced the *per-consumer* overhead cost of operation as to more than offset the per consumer cost of softening. As a going concern, therefore, our profits are greater than before the softener installation, and hence from the point of view of the public's ownership of the waterworks as well as from their point of view as patrons, the softening plant was a wise investment.

Among the benefits accruing from the softening of the water, perhaps the most important of all is personal satisfaction of using a softened water. The direct saving in soaps and washing powders and in wear and tear on clothes is very marked. The elimination of numerous rain-water tanks has not only saved the cost of their frequent cleaning and repairs, but has also materially reduced the number of mosquito-breeding places and thereby tended towards better health conditions. Before the softener was installed, houses were generally equipped with a double plumbing system, one for the hard water to be used for all purposes except bath and laundry, the other for rain water. The cost of this extra piping, tank, etc., was about $100 per residence, the interest and depreciation on which was several times the cost of softening the 50,000 gallons which is about the average annual consumption per customer.

Not every city that has a hard water supply would find it feasible to install a softener. Each city has a distinct problem to be considered independently, and engineers are looked for the discovery, presentation and solution of such problems. All engineers have more or less influence and to that extent are trustees of public interests and accountable to their fellow men.

Whether it be in small things or in great things, in improving the quality of a municipal water supply or in engineering vast armies over the Rhine to Berlin, engineers should ever keep uppermost the democratic thought of public service, than which there is not, nor can there be, any higher calling.

USE OF TAR ON HIGHWAYS *

English and American Practice in the Construction of Tar Pavements—Tar Concrete Pavements—Classification—Patents—Construction.

By ARTHUR H. BLANCHARD, M. Am. Soc., C. E. †

TAR CONCRETE PAVEMENTS.

A tar concrete is one composed of broken stone, broken slag, gravel or shell, with or without sand, Portland cement, fine inert material or combinations thereof, and a tar cement incorporated together by a mixing method.

Classification: Tar concrete pavements may generally be grouped in three classes. The essential characteristics of the three classes are as follows:

Class A. A tar concrete pavement having a mineral aggregate composed of one product of a crushing or screening plant.

Class B. A tar concrete pavement having a mineral aggregate composed of a certain number of parts by weight or volume of one product of a crushing or screening plant and a certain number of parts by weight or volume of sand, broken stone screenings or similar material, with or without a filler.

Class C. A tar concrete pavement having a predetermined mechanically graded aggregate composed of broken stone, broken slag, gravel or shell, with or without sand, Portland cement, fine inert material or combinations thereof.

Patent Litigation: In connection with the design or selection of a suitable type of tar concrete pavement, it is necessary to consider the possibility of an infringement suit being brought by one of the patentees of proprietary pavements. Highway engineers and contractors are primarily interested in the types of tar concrete pavements which may be constructed without danger of litigation rather than in a voluminous discussion of the probabilities of successfully defending infringement suits.

Class A. There is ample evidence at hand that tar concrete pavements of Class A may be constructed without danger of litigation proceedings.

Class B. The history of litigation cases indicates that the construction of unpatented tar concrete pavements of Class B on a large scale will, in all probability, lead to an infringement suit.

Class C. With the exception of the class of tar concrete pavements having mineral aggregates similar to that covered by the Topeka decree, the extensive use of non-patented tar concrete pavements of Class C will usually lead to litigation proceedings.

Foundations: Many failures have occurred due to laying tar concrete pavements on weak foundations. Of the more common types of foundations, satisfactory results have been obtained under medium traffic with thoroughly filled and compacted broken stone and tar concrete foundations. Cement-concrete foundations should generally be used.

Construction: Under Class A, two types of pavements will be considered. The most efficient type, as laid in America, has a mineral aggregate which will comply with the following requirements: All of the broken stone or broken slag shall pass a 1¼-inch screen; not more than 10 per cent nor less than 1 per cent shall be retained on a 1-inch screen; not more than 10 per cent nor less than 3 per cent shall pass a ¼-inch screen.

This aggregate, for small jobs, may be mixed with hot tar cement by hand methods. Usually, however, mechanical heating and mixing plants should be used. In a complete plant for the manufacture of tar concrete, the aggregate is carried by bucket elevators to rotary dryers, where it is dried and the dust exhausted; from the dryer the aggregate is raised by elevators to storage bins; when required the aggregate is drawn from the bins to a weighing device, and from there deposited into a mixer. Such plants are also equipped with tar cement heating tanks and weighing buckets. A plant of this type should have a capacity of from 800 to 1000 square yards to 2-inch wearing surface per day. For the type of tar concrete under consideration, it has been found that the tar mixture should contain between 5 and 8 per cent of tar bitumen.

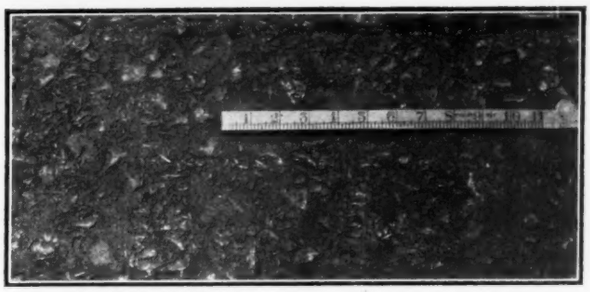
An important detail of laying is thorough rolling. An even surface and adequate compaction with thorough interlocking of the particles of broken stone may be readily obtained by the proper use of a tandem roller weighing between 10 and 12 tons.

Many methods have been developed for the application of the seal coat of tar. It has been found that seal coats of from one-half to one gallon per square yard of tar cement are distributed most uniformly by the use of hand-drawn gravity distributors followed by a squeegee.

The average cost of this type of tar concrete under normal conditions when laid as a 2-inch wearing course should be from 25 to 40 cents in excess of a water-bound broken stone wearing course of the same thickness.

The second type of tar concrete of Class A to be considered is the two or three-course pavements in which

* Continued from Page 446.
† Consulting highway engineer, New York.



TAR CONCRETE SURFACE AFTER WEAR FOR FIVE YEARS, NOW NEEDING ANOTHER SEAL COAT.

each course consists of one product of a crushing or screening plant. The excellent tar slag concrete pavements which have been laid in England since 1903 are of this type. Although used by various municipalities, the largest yardage of this type has been constructed by Tarmac, Ltd. One of the Tarmac plants is located at Wolverhampton, adjacent to that of a company producing large quantities of blast-furnace slag. The large molds of slag are transported by small cars from the iron works on a narrow gauge track and dumped near the Tarmac works. These large blocks, while still warm, are broken by sledgehammers to a size suitable for the crusher. After it is crushed and screened into sizes varying from ¼ to 2½ inches it is mixed with a tar compound. Since the slag is warm even after it has been crushed, no heating preliminary to mixing is necessary.

Although in some cases two courses of tar-slag concrete are used, usually more than two layers of tar-coated slag are employed, as was the case with tar-slag concrete pavement laid at Brighton-on-Sea. The details of construction follow: On a well-compacted gravel foundation was spread a scattering of tar-coated slag chips; the bottom layer was composed of 2½ inches of compacted 1¼ to 2½-inch tar-coated slag; the second course consisted of 2 inches of compacted ½ to 1½-inch tar-coated slag; the third course was composed of a thin layer of ⅛ to ⅜-inch tar-coated slag chips, which layer was thoroughly rolled; the pavement was finished by rolling a top dressing of uncoated fine slag screenings.

Tar concrete pavements of Class C, with mineral aggregates similar to the modern Topeka grading, were laid in Pittsburgh, Pa., about 1890. The pavement laid on Lang avenue has been in service, with only nominal repairs, for the past 26 years. Many similar pavements were constructed in several cities of New England as early as 1885. Since 1913 tar Topeka pavements have been laid in several states throughout the Middle West of the United States and also in cities of New England. Some of the best examples of this type of tar concrete pavement has been constructed with about 8 per cent of bitumen in the mix and a light seal coat of refined tar.

TUBERCULOSIS SURVEY IN OKLAHOMA.

To furnish data for combatting tuberculosis and other communicable diseases in Oklahoma, besides improving the general health conditions throughout the state, the Oklahoma Association for the Prevention of Tuberculosis is having a survey made by M. P. Horowitz, of the Department of Biology and Public Health, Massachusetts Institute of Technology, and Dr. Gayfree Ellison, Professor of Bacteriology and Hygiene of the University of Oklahoma, assisted by members of the executive and nursing staff of the association, the State Board of Health and the Board of Agriculture. The survey will include Oklahoma City, Tulsa, Muskogee, Enid, Shawnee, Bartlesville, Ardmore, Chickasha and McAlester. They will continue through the month of September.

WATER WORKS OPERATION—DISTRIBUTION SYSTEM

Keeping Fire Hydrants in Serviceable Condition—Preventing Indiscriminate Use—Inspection of All Parts and Remedying Defects.

INSPECTING FIRE HYDRANTS.

Like valves, fire hydrants are not needed for fire purposes very often, but when one is needed it is of the utmost importance that it should give perfect service instantly. Someone should be held responsible and receive public condemnation if a fire hydrant does not meet requirements when called upon for use.

In order that a given official may be held responsible, however, he must have full authority and power in the control of the hydrants. This means that the City Council should provide ordinances forbidding the use of any fire hydrants except by authority and under regulations issued by the responsible official, and the police and courts should co-operate in enforcing the ordinances. If sprinkling cart drivers, builders and almost anyone is permitted to use the hydrants, no blame can attach to any official should they fail the firemen in an emergency. It is probably practicable to arrange for the occasional use of fire hydrants for purposes other than fire, one essential provision in such arrangement being that immediately after each such use the fire hydrant shall be inspected by a representative of the official responsible for them and such inspection paid for as a part of the fee charged for the use of the hydrant. Except under conditions which provide for an inspection of all hydrants every day or two while being so used, no use of them for other than fire purposes should be permitted. For sprinkling carts probably the best plan is the use of special standing pipes or "cranes" connected with the mains and each provided with a shut-off valve and a hose connection on the end. These not only save the fire hydrants but are also more convenient and save the time of the drivers of the carts.

Some cities have endeavored to prevent the unauthorized use of fire hydrants by providing stem nuts that cannot be turned with a monkey wrench, generally three-sided or five-sided. The result of this is generally that the party desiring to use it employs a pipe wrench, which rapidly wears off the corners of the nut. The only safe rule is to give the citizens to understand that anyone found using a fire hydrant will be arrested and fined unless he can show a permit for such use.

When a fire hydrant is in good order, the stem moves easily and the stuffing box in the top of the hydrant through which it passes does not leak; the gate does not "flutter" when it approaches or leaves the seat and it closes tightly so that absolutely no water leaks into the barrel. Also, the gate opens wide so as to obstruct the water as little as possible and give the maximum obtainable pressure. The drip drains the water from the hydrant barrel rapidly when the hydrant is closed and closes tightly when it is opened. The threads of the outlet nipple are not battered (they should be of standard gage). Each hose outlet or nozzle should be provided with a cap which is attached to the hydrant by a chain and the cap should always be on the nozzle. Also, the threads on both nipple and cap should be kept greased so that the cap can be removed easily; although in putting the cap on it is well to screw it tight against the shoulder so that some pressure is necessary to start it, since this will prevent mischievous boys from removing the cap by hand and dropping stones and sticks into the barrel.

In order to prevent the breaking of fire hydrants by

CLEANING MAINS, LEAKAGE AND METERS (Continued).

City and state	Do mains need cleaning at intervals?	Method of cleaning	Methods of detecting and preventing leakage and waste	Is leakage enough to make radical action desirable?	Percentage of services metered	Owner of meters*
New Mexico:						
East Las Vegas	No	.....	None	No	10	Company
Raton	No	.....	.....	No	12.5	Consumer
New York:						
Amityville	....	.....	Sounding rod	No	1	Consumer
Carthage	No	.....	None	No	50	Consumer
Dansville	No	Flushing	None	No	None	.....
Elmira	No	.....	Meters	No	98	City
Glens Falls	No	.....	Inspection	No	2	City
Gloversville	No	.....	.....	No	100	City
Hoosick Falls	No	.....	Various	No	Small	Consumer
Homer	No	.....	Aquaphone	Yes	20	Consumer
Jamestown	No	.....	Meters	No	100	City
Kingston	No	.....	Pressure	No	....	City
Lancaster	No	.....	None	No	100	Consumer
Mechanicsville	....	Not done	Darley leak locator	No	100	Consumer
Mt. Morris	....	.....	None	No	2	Consumer
Mt. Vernon	Yes	By contract	Pitometer survey	No	100	Company
Newburgh	Yes	Not cleaned	Inspection	No	Small[p]	City
Olean	No	.....	None	No	100	Consumer
Oneonta	....	.....	Inspection	No	3	Consumer
Ossining	Yes	Flushing	Inspection	No	95	Consumer
Oswego	Yes	Flushing	Inspection	No	Small[s]	City
Peekskill	No	.....	Surface inspection	No	100	City
Seneca Falls	No	.....	Watchfulness	Think not	2.5	Company
Sidney	No	Flushing	Patrol	No	None	.....
Solvay	No	.....	Master meter, watch'g sewers	No	100	Consumer
Spring Valley	No	.....	Meters	No	100	Company
Tarrytown	....	Never cleaned	Sound and pressure gage	....[g]	100	Consumer
Tonawanda	Yes	Flushing	Inspection	Yes	2	Both
Waterloo	No	.....	Inspection	No	25	Company
Waverly	Not much	.....	Venturi meter	No	40	Consumer
North Carolina:						
Charlotte	Yes	Not cleaned	Meters	No	100	City
High Point	....	Never cleaned	Meters	No	85	Consumer
Lenoir	Yes	Not cleaned	None	No	100	City
New Bern	Yes	Not cleaned	Inspection	No	10	City[r]
Raleigh	No	.....	None	No	29.5	Both
Rocky Mount	No	.....	Inspection	No	100	City
Statesville	Yes	Flushing	Meters	No	90	Consumer

* The word "city" is used to designate municipalities of any nature or water districts; g—consumers own a few; p—only manufacturers and saloons metered; r—consumers own larger than 2-inch; s—for ⅝-inch meter.

METERS. RATES. MUNICIPAL USE (Continued)

City and state	Is deposit on meter required?	Is rental charged for meters? †	Does city obtain water without payment?	Use made of free water	Used for Municipal Purposes: Percentage	Used for Municipal Purposes: Is any of it metered?
New Jersey (Continued):						
Helmetta	No	No	Yes	All city uses	.....	.....
Irvington	No	No	No	.....	2	All
Milltown	.....	.....	....	.....	5	Schools
Newton	No	Yes	....	.....	20	No
Nutley	.....	.....	No	.....	.....	All but sprinkling
Jamesburg	No	No	....	.....	.....	.....
Pleasantville	No	No	Yes	City hall and fire house	.....	No
Princeton	No	No	Yes	Flushing streets and sewers	.....	All buildings
Rahway	No	No	Yes	All municipal uses	.....	No
Wallington	No	No	No	.....	.....	No
New Mexico:						
East Las Vegas	No	No	No	.....	5	No
Raton	.....	.....	Yes	Sewers, streets and parks	Small	No
New York:						
Amityville	.....	.....	No	.....	.....	No
Carthage	Yes	.....	Yes	Schools, churches and fountains	5	No
Dansville	.....	.....	No	.....	10	No
Elmira	Non-owners	.....	No	.....	3 to 5	All buildings
Glens Falls	No	No	Yes	All municipal uses	.....	No
Gloversville	.....	No	Yes	All municipal uses	20	.....
Hoosick Falls	No	No	Yes	Flushing	5	No
Homer	.....	.....	Yes	Schools, churches, fountains	.....	No
Jamestown	No	No	Yes	General municipal uses	10	Buildings and flush tanks
Kingston	.....	.....	Yes	Sewers and sprinkling	.....	No
Lancaster	No	No	No	.....	15	Schools
Mechanicsville	.....	.....	No	.....	10	No
Mt. Morris	.....	.....	Yes	Sprinkling	.....	.....
Mt. Vernon	No	No	Yes	Flushing sewers, fire houses, fountains	0.5	Fire houses and fountains
Newburgh	No	No	....	.....	.....	.....
Olean	No	No	Yes	All but street sprinkling and schools	2	All
Oneonta	.....	.....	No	.....	.....	Schools
Ossining	.....	.....	Yes	Sprinkling, fountains, sewers	25	No
Oswego	Yes	No	Yes	Public buildings and fire	.....	No
Peekskill	No	Yes	Yes	Sprinkling, parks, hospitals, all municipal buildings, fire	25	No
Seneca Falls	No	No	No	.....	.....	No
Sidney	.....	.....	No	.....	.....	No
Solvay	.....	.....	Yes	All municipal uses	15	Yes
Spring Valley	No	No	No	.....	.....	Schools
Tarrytown	.....	.....	Yes	Sprinkling, fountains, flush tanks	.....	No
Tonawanda	No	No	No	.....	.....	No
Waterloo	No	Minimum charge	Yes	Public buildings	10	No
Waverly	.....	.....	Yes	Fountains and public bldgs.	Small	Schools

† Amounts given are annual rentals, in some cases reported as quarterly or monthly.

the wheel hubs of trucks or other vehicles, the hydrant should be at least a foot back from the face of the curb. Where set closer than this, it is desirable to place an iron post just back of the curb on each side of the hydrant to protect it.

In order to be sure that the hydrants are maintained in good condition, they should be tested at least every spring after danger of freezing has passed, and every fall before it arrives, as well as after every known use of the hydrant. These tests should include inspection of each of the points named above, and generally, as a routine operation, a repacking and relubricating of the stuffing box, greasing of the threads of the nozzle and of their caps, so that there may be no delay in using the hydrant. (Waterproof graphite grease is recommended for the nozzles.)

Unless the main valve at the bottom of the barrel is tight, the barrel is liable to fill with water and this in turn to freeze when cold weather arrives, which puts the hydrant entirely out of commission. Unless the drip closes tightly when the main valve is opened, water entering the barrel will escape through the drip into the surrounding ground and keep this so water-soaked that after the use of the hydrant, the barrel will fail to drain and the water in it may freeze. If the drip does not drain freely when the valve is closed, this may be due to a corrosion of the opening, to a packing of it with dirt or to the growth of tree roots into it. In case the stoppage of it is due to corrosion or foreign matter, this may frequently be removed by taking off the top of the hydrant and pushing through the opening a copper wire on the end of a rod. (Care should be exercised not to use a steel wire with a rough end, which would be apt to scratch the seat of the drip and prevent its closing tightly.) Another method of clearing the drip opening is to close tightly all the hydrant nozzles and open the main valve until the pressure has compressed the air in the top of the hydrant, and the barrel is approximately half full of water. Then close the main valve, which operation also opens the drip valve, when the compressed air will tend to force the water out through the drip. If a drip is closed by a root, the obstruction is apt to repeat itself as often as removed and probably the only permanent remedy is to carry a small drain pipe from the drip to a sewer if one is available, or to such point as is beyond the reach of tree roots. "Fluttering" of the gate is apt to cause more or less water-hammer, which may loosen joints and cause leakage even if it does not break any pipes; but perhaps more important is the fact that it is probably due to the gate being loose on the stem or else to a stem which is of too light a weight, either of which may result in a breaking of the hydrant or inability to close the valve tightly. The valves of compression hydrants are provided with leather or rubber faces, and these will not remain in serviceable condition indefinitely, but should be renewed occasionally. Whenever it is found on inspection that the valve cannot be closed tight without exercising considerable pressure, it is probably desirable to put on new leathers. In some cases the increase of resistance to turning the stem may seem to indicate that the valve is wide open when in reality it is merely caused by friction of the thread of the stem in the valve nut. The person making the inspection should know, for each type of hydrant in use, just how many turns are required to open the valve wide, and should see that it is possible to make this number of turns without exerting undue pressure on the stem, and if this is not possible, the stem should be removed and any roughness filed off and the stem thoroughly greased.

The hydrant as a whole should be readily findable under any conditions. This means that some part of it at least should be of a color which can be seen readily at night, while the top should be visible against a white snow-covered ground surface. Probably these requirements are best met by painting the body of the hydrant white or some other light color, and the top of it red or some other dark color. Whatever the colors used, the hydrant should be kept painted for the general appearance of the street as well as to facilitate finding it. In this connection, proper maintenance requires also that snow be removed from in front of and around every fire hydrant, it being made the duty of the abutting property owners, or the street cleaning department, or of some other specially designated person, to see that the snow is removed promptly—in fact, that it is not ever allowed to entirely cover the hydrant even during the heaviest snowfalls.

The preservation of hydrants from freezing and thawing of those frozen will be considered later in connection with similar care of services and mains.

THREE GARBAGE INCINERATORS

Description of Those at Virginia, Chisholm and Hibbing, Minnesota—Replace Rat-Infested Garbage Dumps—Collection of Garbage.

Three incinerators of three different makes, used by the cities of Virginia, Chisholm and Hibbing, Minnesota, have been installed during the past three years, and each is said to have given very good results. They were described by E. J. Hawley a few weeks ago in a paper befor the Minnesota Surveyors' and Engineers' Society entitled "Garbage and Refuse Disposal on the Mesaba Iron Range." This paper, slightly condensed, is as follows:

About 1912 rats began to appear in great numbers in this district, and it was concluded that the problem of getting rid of them could be solved to a large extent by abolishing the garbage dumps, dumping being the method employed by all the communities for disposing of their garbage and refuse. The city of Virginia was the first to adopt incineration, and was followed by the villages of Chisholm and Hibbing.

THE VIRGINIA INCINERATOR.

In 1913 the city of Virginia erected a 25-ton capacity Decarie incinerator. The building enclosing the incinerating equipment is of concrete, brick and steel construction, and is approximately 30x35 ft. There are two floors. The upper or hopper floor is reached by concrete approaches at the sides. A radial brick chimney, 4 ft. in diameter at the top and 125 ft. high, carries off the smoke and gases.

The equipment consists of a main incinerator, combustion chamber, preheater and breeching, forced and induced draft fans, feed pumps and injectors.

The incinerator proper consists of a Decarie patent garbage and refuse burner of the all-steel water-jacket type. It is equipped with two sets of grates, one set being a Decarie circulating water-tube grate, made of 2-in. extra-heavy lap-welded pipe, the other being a cast-iron shaking grate of special design for burning refuse.

The ash pits are made in two sections, each of which is provided with two forced draft nozzles to give uniform distribution of air beneath the grates.

The combustion chamber is 14 ft. by 6 ft. 8 in., is constructed of steel casing and lined with 9 in. of fire brick.

The pre-heater is 5 ft. wide by 6 ft. 10 in. long, and is made up of about 400 2½-in. tubes 6 ft. long, expanded into steel plate heads and have a casing of 3/16-in. tank steel plate.

The forced-draft fan is a 70-in. three-quarter housed special American Blower Co. steel fan. It is driven by a direct-connected high-speed engine.

The induced draft fan is a No. 7 American Blower Co. "Sirocco," driven by a high-speed steam engine.

All refuse is dumped directly through the hopper openings into the incinerator. Carcasses pass through these same openings without mutilation. When refuse is dumped, it falls on the circulating water-tube grate, where it comes in direct contact with the fire which is on the lower shaking grate. The material is held entirely away from the walls of the incinerator by the circulating water tubes of this upper grate.

The gases of combustion pass from the incinerator proper into the brick-lined combustion chamber, where they complete their combustion, destroy the odors, and deposit the dust and unburned particles in the dust collector before going into the chimney.

The pre-heater is located between the combustion chamber and the chimney, and the gases pass through its tubes on their way to the chimney.

The air supplying the forced-draft fan is drawn through the pre-heater around the tubes, obtaining its heat from the gases of combustion which are inside the tubes, before being sent through the ducts to the ash pit of the incinerator.

The induced-draft fan draws the gases from the breeching at a point between the pre-heater and the chimney, and discharges same into chimney.

This plant, according to the officials of the city of Virginia, has been very successful. While its first cost is somewhat high, the cost of upkeep is very small.

THE CHISHOLM INCINERATOR.

In 1914 the village of Chisholm constructed a one-unit McGuire-Hunter incinerator. The furnace is housed in a brick building, 24 ft. x 42 ft., with concrete approaches. The furnace is 13 ft. long and 9 ft. wide and is constructed of fire brick with an arched roof about 1½ ft. high above the fire grate at the haunches and 3 ft. at the crown.

The fire is on a level with the bottom of the furnace proper, and burns down instead of up, as is the usual method. The chimney, which is only 28 ft. high, is built at the same end of the furnace as the firebox, but in the opposite corner. The flames pass from the firebox to the back end of the furnace, down and forward again to the chimney; the curved roof deflecting them onto the garbage. During this operation, the odors and gases in the furnace are consumed before they pass to the chimney.

Notwithstanding the apparently low chimney, there is no offensive odor in or about the building. The plant is operated by one man, and is capable of handling six tons of garbage every eighteen hours. A hot water coil and tank is connected with the furnace for heating water for sterilizing purposes.

This type of incinerator, because of its small first cost, is admirably adapted for the small town of limited means.

THE HIBBING INCINERATOR.

In 1916 the village of Hibbing constructed a twin incinerator patented by G. A. Oveson of International Falls, Minn. This plant, like the two described before, is housed in a brick building, 24 ft. x 38 ft. inside. The furnace and fuel room, which is on a floor below the main floor, is of concrete construction and is 11 ft. x 24 ft. inside. The building is reached by two concrete approaches.

The incinerator proper consists of two units, the smoke and gases from which enter into one chimney. Each unit, which is of ten tons capacity, is very simple in its construction. It consists of a large egg-shaped furnace 11 ft. high and 6 ft. at its greatest diameter. The receiving chamber is directly above the firebox, and the chamber being smaller at the bottom than at the top, all refuse falls toward the center directly over the fire. The furnace is built of ordinary brick with a fire brick lining. The firebox is of a triangular shape, with an opening at the top into the receiving chamber. There are no gates of any kind. On top of the receiving chamber there was originally a dome, constructed of sheet steel, into which two doors were inserted. The top of the dome was connected with breeching to the chimney.

The steel dome and breeching proved to be the weak part of the apparatus. After being in use a few months, the dome became warped, and soon burned out, so that it became necessary to make an improvement. The steel dome and breeching were entirely removed, and the receiving chamber was bricked up to the chimney. A fire-brick arch was constructed from the floor up into the chimney. A heavy cast door was built into the brick work. This proved to be a great improvement. In addition to replacing the dome with fire brick, the receiving chamber was relined once during the 1½ years the plant has been in service. At the present time it is a very efficient plant, crude though it appears to be.

On account of the depth from the main floor to the bottom of the units, it is more economical to build this type of plant on a very steep side hill. This will also shorten the approaches to the building.

None of these three plants entirely consume tin cans, but after being put through the incinerator the cans oxidize very rapidly and soon crumble into dust. The most troublesome thing to contend with in an incinerator is bottles. These melt and form great masses in the furnace, which when cooled are very hard to remove.

The collection of garbage on the Mesaba Range is done by day labor. No tax is made against the individual for this work, and it is very efficiently done. Ordinances have been passed requiring all kitchen garbage to be drained, and all unburnable substances to be placed in separate packages. In spite of such ordinances, it is a very frequent occurrence to see portions of cook stoves, bed springs, chunks of concrete and even rocks dumped at the incinerator to be burned.

The cost of burning per ton is dependent to a marked extent on the skill of the attendant. By carefully sorting the refuse and mixing the household garbage with the barrels and boxes from the stores, the fuel cost can be made very low.

The wagon usually employed in the collection of garbage is a steel dump wagon of the Holsbrog type. Ordinary refuse is hauled in a dump wagon.

Since the advent of the incinerator, the garbage dump has disappeared. The old dump site in the village of Hibbing has been cleaned up and platted, and there now are several fine residences overlooking the most beautiful park on the Mesaba Range, from what was formerly the garbage dump.

The incinerators have done much for the health and comfort of the people. They, in conjunction with the small boy, have done much toward exterminating the rats that infest the towns. Two years ago the village of Hibbing averaged $25 per week for bounties on rat tails at 5 cents each. Today the average weekly bounty is less than $5.

Municipal Journal

Published weekly at
243 West 39th Street
by
Municipal Journal and Engineer, Inc.

S. W. HUME, President
J. T. MORRIS, Treas. and Mgr. A. PRESCOTT FOLWELL, Sec'y

A. PRESCOTT FOLWELL, Editor
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Telephone, 9591 Bryant, New York
Western Office, Monadnock Block, Chicago

Subscription Rates.

United States and possessions, Mexico and Cuba.....$3.00 per year
All other countries..... 4.00 per year
Entered as second-class matter, January 3, 1906, at the Post Office at New York, N. Y., under the Act of Congress of March 3, 1879.

Change of Address.

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

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Contributions suitable for this paper, either in the form of special articles or as letters discussing municipal matters, are invited and paid for.

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Municipal Bonds in Demand.

In view of the necessity for greatly increasing the revenue of the Federal Government, it seems very probable, as is reported, that there will be an increase in the amount to be raised by taxes on incomes. This has led those whose incomes from investments are large to cast about for forms of investment that will be free from income taxation, from which has resulted an increased demand for state and municipal bonds, which are exempt from income taxation. The result has been that during May the sale of such bonds was over $28,000,000 or nearly $8,000,000 more than during May of last year, and nearly as much as in May 1916. The average for the preceeding four months of 1918 was about $21,000,000 while the sales for April of this year, while the Third Liberty Loan Drive was on, was only about $14,000,000. With the growing popularity with thousands of individual investors, there is a curtailed supply, and those bonds that are now for sale are enjoying an excellent market.

In spite of the favorable figures given above, which were quoted from the Daily Bond Buyer, that paper calls attention to the fact that the total for the first five months of the year is very much below the average amount of sales for that period, and is in fact the lowest during the past ten years, "emphasizing the restrictive influence of the war on the activities of American states, counties, cities and villages." Indications are therefore that such municipal bonds as may be issued this month for road construction, or other public works whose construction is approved, can be disposed of promptly and at a favorable figure with little if any difficulty.

WHEEL TAXES FOR ROAD FUNDS.

Pleasure vehicles should pay a large part of the cost of constructing and maintaining roadways, and relieve the general taxpayer proportionately.

A proposition to raise the money for constructing and maintaining roadways in both city streets and country highways is being advocated by Charles A. Mullen, director of the Paving Department of Milton Hersey Company, who, without claiming originality for the idea, believes it is essentially a sound one and would be an improvement on the present method of raising road funds. Roads are built and paved for wheels and therefore he thinks it would be logical that they should be paid for by the wheels rather than from the general taxes or by abutting property owners.

One argument he offers in favor of this is that at present we are fooling ourselves very badly as to the cost of highway transportation, a large part of which cost is really that of the roadways used by it, but which are constructed and maintained largely from public funds. Some states, it is true, are using automobile license fees for road maintenance, but this seldom, if ever, is sufficient to provide adequate maintenance, to say nothing of construction and reconstruction. Another argument he offers is that vehicle owners would have it more directly in their power to enforce a proper maintenance of roads, if they furnished the entire cost thereof. He quotes Montreal as an illustration of a city which, because of the necessity of reducing expenditures from the general treasury, has allowed its roadways to get into a condition that costs vehicle owners much more in repairs and in excess of horse power, both of gasoline and of animals, than the saving to the city treasury. Had the maintenance funds been furnished by them, there probably would have been no objection upon the part of the city's officials to maintaining as good roads as the vehicle owners would be willing to provide the money for. If it is argued that the sidewalks should be paid for by the same system, it may be replied, that such is now the case, to a certain degree at least; since all citizens use the sidewalks, all taxpayers should contribute to their maintenance. To the adverse argument that this would be getting away from free public roads, he replies that they are not free now, only everyone is paying for them, but by an unsatisfactory method. "Someone must always pay, so why not have the burden fall equitably upon the road users through a wheel or vehicle tax?"

We have already intimated in these columns our opinion that such a plan is the logical one and should be considered. One argument not referred to by Mr. Mullen is that, with the advent of the automobile, the wheel tax method of raising road funds becomes more logical than ever. A generation ago most of the vehicles used on city streets were employed by merchants and manufacturers in delivering goods for general consumption, and any decrease in cost brought about by improvements in road conditions presumably reduced the cost to the ultimate consumer. While the large consumer benefited to a greater extent than the small one, he also generally paid the largest share of taxes. With the rapid increase in the number of pleasure automobiles, however, we find a large part of the wear and the largest share of the demand for the smoothest pavements resulting from the use of the roadways by these, and consequently a considerable part of the recent increase in expenditures for roadways is for the benefit of that proportion of the taxpayers who own pleasure automobiles. While it is true that the proportion is a considerable and an increasing one, it still constitutes a com-

paratively small part of the entire list of taxpayers and this part is benefiting by the expenditures of all, without giving to anyone except themselves any return for such use of the roadways.

To such extent as expenditures for construction and maintenance are necessitated by pleasure vehicles, the non-owner, therefore, is paying for something for which he receives nothing in return either directly or indirectly. It seems to us that whatever may be said against the taxing of commercial vehicles, the taxing of pleasure vehicles to an amount that will cover the expenditures made necessary by them is something that the taxpayers at large would be fully justified in demanding. It is not just that any part of the taxes paid by the poor man who does not own an automobile should be used to provide roadways for pleasure riding by the rich.

Fire Hose Becoming Scarce.

Fire commissioner Drennan of New York has asked, and the aldermen have granted, the issuing of $142,770 of special bonds for the purchase of fire hose. Nearly 125,000 feet of the hose on hand is eight years old or more, and that age is considered the limit of safety—in fact, some hose does not last eight years, and manufacturers will not guarantee it for more than three years. Another consideration is that the price of hose will probably rise, if in fact the federal government does not take the entire output.

HIGHWAY MATERIALS ON CAR PREFERENTIAL LIST.

The car service section of the railroad administration has placed stone, sand and gravel for highway purposes next to coal, coke and ore in the preferential list for the use of open-top cars. The following are the regulations issued:

1. Open top cars, suitable for such traffic, should be furnished preferentially for the transportation of coal, coke and ore.

2. Available open top cars, not suitable for the transportation of coal, coke, or ore may be furnished for the transportation of stone, sand and gravel, and when so furnished shall be used preferentially for highway maintenance materials.

3. Open top cars, suitable for the transportation of coal, coke and ore, and available on coal, coke or ore producing roads in excess of the demand of such commodities, may be furnished for the transportation of stone, sand and gravel, and when so furnished shall be used preferentially for highway maintenance materials. The return movement to mines or ovens should be utilized wherever practicable in furnishing car supply for stone, sand and gravel. Every endeavor should be made consistent with keeping up the production of coal, coke and ore, to furnish shippers of stone, sand and gravel with a minimum of forty per cent. of their normal weekly transportation requirements.

4. Roads which are not producers of coal, coke or ore must not use foreign open top equipment for stone, sand or gravel shipments, except for one load in the course of the return movement to mines or ovens.

5. Where the transportation needs of essential road construction or maintenance projects cannot be met by car supply furnished in acordance with the above rules, the state, county or municipal officials in charge of the work, should, through their proper state highway department, apply to the Director of the Bureau of Public Roads, United States Department of Agriculture, Washington, D. C., for assistance. Such applications will be considered by representatives of the Department of Agriculture, the War Department, the War Industries Board, the Fuel Administration and the Railroad Administration, and in accordance with the recommendations of such representatives, the Car Service Section will endeavor to furnish car supplies necessary for approved essential road construction or maintenance. It must be understood that car supply for stone, sand and gravel must not be permitted to jeopardize the essential production of coal, coke or ore. If at any time such a result is apparent on individual roads, or generally, orders will immediately issue to curtail the car supply for stone, sand and gravel.

THE A. W. W. A. CONVENTION *

Conclusion of Description of the Thirty-eighth Annual Convention—Experiences with Frozen Services in a Number of Cities—Cost of Thawing.

Reported by CHARLES CARROLL BROWN.

New Rochelle, with 154 miles of pipe and 8,000 consumers, had over 700 frozen meters and 300 services, which were thawed by the electric light company. Many were frozen at the goose-neck and many at the curb, but the principal trouble was at the foundation wall. The depth of frost varied from 8 in. to 4 ft. or even more, the former being in a road covered with snow, although the depth of frost in a terraced lawn alongside was 30 in. Trouble from freezing occurred from December 13 to April. Many service breaks occurred when the frost went out. One main and one hydrant froze.

Chester, Pa., had 2,000 meters freeze in basements on account of lack of coal; also some in curb boxes. Reasons given for the latter were loosely packed sand and gravel around them, risers touching side of meter box, not deep enough to get below the 36-in. of frost.

Terre Haute had 66 service pipes frozen, all but four under paved streets. They were thawed by steam without charge to consumer. The electric light company did not have transformers and could not help. Six hundred meters were frozen. They were taken out and pipe inserted and the water let run to prevent freezing until the cold spell passed, when new meters were set. Of the frozen meters 2.6 per cent were in basements, 11.2 per cent were in 15-in. tile boxes, 4.5 per cent in 18-in. tile boxes, 16 per cent in 3-ft. brick pits, while in brick pits 5 ft. deep there were none. The frost penetrates deeper in the sand and gravel than in the clay of a neighboring city where services 2.5 ft. deep were not frozen.

Syracuse used a gasoline generator thawing outfit, with automobile engine and 15 k.w. d.c. generator at 10 to 50 volts at 1,200 r. p. m., and a switchboard, all put on a sleigh or truck when in use and drawn by a team. Three men were required. Two cables were connected to hydrant and pipes in interior of house, the meter being disconnected. A 20-volt current at the start was increased to 20 to 50 to make the amperage 300. From 2 to 15 min. was required to thaw the small 3A lead services. The total time required averaged 15 min., or 20 services a day if not too far apart. Services are 4 to 4.5 ft. deep. The electric light company also used three outfits. A current of 600 amperes was required for 20 min. to thaw a 6-in. hydrant branch.

In Richmond, Va., many meters and services were frozen, very few meters being damaged. Depth of frost was 30 to 32 in.

In Troy, N. Y., average depth of frost was 5.5 ft. and maximum was 7 ft.

Mason City had 150 services frozen and 2 lead pipes burst, also some frozen mains and 2 hydrants. All were thawed with a steamer. Daily inspections were made of all important hydrants. Colored water through a tap was a sign that freezing was beginning and water was let run until danger had passed.

* Concluded from page 453.

In Jefferson City, Mo., no service pipes were frozen but nearly 10 per cent of the meters froze.

St. Louis had no mains frozen. Most of the service pipes frozen were where street grades had been lowered. No 2-in. services were frozen. These are put in by the water department, all others by the consumer. Local plumbers thawed the services, digging up and relaying pipe, using a portable steamer with ¼-in. rubber tube to insert in the pipe, requiring three to eight hours and costing $10 to $15.

At Lawrence, Kan., about 100 services were frozen, of which 40 were thawed by electricity, the water department borrowing a 2,300-volt transformer from the electric light company and two resistance boxes. Services were from 25 to 100 feet long and required current for five minutes to an hour or more. The outfit was put on a wagon used as a trailer to an auto truck. Twelve services were thawed in a day.

In St. Louis County, Mo., frost was 39-in. deep and 42 ins. in exposed places. There are about 100 miles of galvanized pipe over which streets have been graded and paved since laying. They all froze this winter. Hot sand was tried but was not satisfactory. A 4,000-volt transformer was obtained and 64 lines of pipe were thawed out readily. About 2,000 services and 1,200 meters were frozen. In a few cases four meters in succession froze on the same connection.

In Minneapolis mains are laid eight feet deep and the frost is often of that depth. The 300 frozen services were thawed by a 40-50 h. p. gasoline engine and 20-k.w. d.-c. generator that were mounted on a frame and put on a truck to haul to place of use.

In Milwaukee, with 84,000 services from mains 6.5 ft. deep, neither mains nor services were frozen. All services must be laid 6 ft. below the established grade and with not less than 6 ft. cover.

The following figures showing cost were given:

The electrical apparatus used in Paterson cost $800 and the average cost of thawing a service was $8.20, half paid by the consumer, including all expenses, overhead charges entire. The Public Service Co. offered a price of $20 for each service thawed which was not accepted. Probably most of the following figures do not include overhead charges.

An Indiana city reported a cost of over $2 a service with current from the electric light plant at about 10 cents per kw.-hr.

In another case a service pipe froze three times in three days, with a charge by the electric light company of $15 for each thawing.

In Madison a block of 6-in. main was thawed by the electric light company for $25. The charge for thawing services was $10 each.

At Kitchener, Ont., the average cost of thawing services with current at 50 cents for each service was a little over $2. There were 360 services frozen and two to three men were required.

At Petersboro, Ont., the cost was $2 to $2.50 per service, five to ten minutes time required. Cost of thawing and repairing meters was 75 cents each.

The charge by the Niagara Falls Electric Company was $10 a service. Plumbers charged much more, a Buffalo plumber claiming he was paid $200 in some cases. Letting the water run cost $4.55 more than not, which was cheaper than thawing by electricity.

In Green Bay, Wis., the electric light company charged $1.50 per hour for current and $3 per hour for crew. The total charge per service ranged from $3.50 to $12.

The electric light company thawed services in New Rochelle for $15 each and had three wagons at work. Others using steam charged much more.

The property owner was charged $7.50 per service by the Trenton, N. J., water department, allowing little or nothing for overhead.

The cost of the electrical apparatus used in Gary, Ind., was $1,500, and the cost for 298 services, three hydrant branches and one main averaged $3 each. The electric light company also used three outfits and charged $10 for each service.

The Canadian General Electric Company will make an outfit to use current from electric light wires for $800.

The cost of the electric generator apparatus used at Saginaw, Mich., was between $800 and $900.

The cost of thawing by steam by St. Louis plumbers was $10 to $15. One plumber, for digging up a service, thawing and relaying it, charged for 37 hrs. plumber at $1.25, 69 hrs. helper at $0.75 and for repaving street and city inspection, $9.00; a total of $141.15.

In Lawrence, Kan., with borrowed and improvised outfit the cost of work with current at 10 cents per hour and a minimum at $1 for each connection, 60 cents an hour for man to make connections and two water works employees at 35 and 26 cents an hour, averaged $3.25 per service, 12 services being thawed in a day and 40 services being thawed in all.

In St. Louis County, Mo., the electric light company charged the water company $1 for each connection of current, and 75 cents an hour for man to make connections, and the cost per service thawed averaged $6.58 for some 2,000 frozen.

The Minneapolis gasoline-generator outfit cost $3,100 and the charge per service of $5 for thawing probably met the expenses of doing the work.

OTHER BUSINESS.

In the afternoon of Thursday the principal papers gave descriptions, illustrated by lantern slides, of the very complete systems of plots and records kept by St. Louis and by the Passaic Water Company, showing the more elaborate nature of the records required by a large department, and the extent of the records required for safe and convenient operation of water systems of all sizes.

A. P. Greensfelder, president of the American Society of Engineering Contractors, presented a plea for standard forms of contract and bond, which resulted in a vote to appoint a committee to draft a standard form of contract and bond to report at the next convention.

Mr. Griswold of Paterson, N. J., presented a paper on standardizing post hydrants and hydrant fittings, giving a history of the efforts in this direction by the Fire Prevention Bureau and the National Fire Protection Association, and demonstrating a method of re-cutting 7 and 8-pitch threads with 7.5-pitch die so as to make close fits with the re-cut fittings.

The method of making nominations for office prescribed by the new constitution was put in operation, the various districts making their nominations for the nominating committee: H. Hymmen, Kitchener, Ont., Dist. 1; H. F. Huy, Buffalo, Dist. 2; C. R. Wood, Philadelphia, and E. W. Humphrey, Erie, tie vote, Dist. 3; H. B. Morgan, Peoria, and W. W. DeBerard, alternate, Dist. 4; J. A. Steele, Jr., Vicksburg, Dist 5; John A. Caulfield, Bismarck, N. D., Dist. 6. Under the revision of the constitution, members in groups of 25 signers have the opportunity of adding names to this list in their respective districts by sending their petitions to the secretary within 60 days. The list for each district is then sent to the members in the district for vote, which must be returned to the secretary before noon, Oct. 20. The executive committee appoints the nominees thus selected as members of the nominating committee, deciding any ties which may occur.

The WEEK'S NEWS

Federal Road Aid—Heavy Trucks Barred on New York Highways—Typhoid Reduced by North Carolina—Niagara Falls Raises Water Rates—Police Shake-Up in Richmond, Va.—City Manager of San Jose Resigns—The Six-Cent Fare Situation in New York—Boston Elevated Railroad to Be State Operated—New York Millionaires Fight Over Zoning System.

ROADS AND PAVEMENTS

Federal Approval for $15,000,000 Aid Roads.

Washington, D. C.—In March and April the Secretary of Agriculture, on recommendation of the Office of Public Roads and Rural Engineering, approved 212 state road-building projects involving more than 2,500 miles of highways under the Federal aid road act. The estimated cost of these improvements to the states is about $15,000,000. The Federal aid allowed is more than $5,000,000.

New Law Bars Heavy Auto Trucks.

Albany, N. Y.—Governor Whitman recently signed the Hewitt bill amending the state highway law relating to auto trucks and trailers. A new section (Sec. 282a) is added as follows: "Auto trucks and trailers in excess of twenty-five thousand pounds. After this section takes effect no person shall operate or drive on the public highways of the state outside of cities an auto truck or trailer having a combined weight of truck and load of more than twenty-five thousand pounds, but this section shall not apply to an auto truck or trailer heretofore registered pursuant to section 282 of this chapter having a combined weight of truck and carrying capacity in excess of twenty-five thousand pounds during the period for which such auto truck or trailer shall have been registered or re-registered." The new law went into immediate effect.

Railroad Refuses to Replace Road.

Salem, Ore.—The public service commission has been notified by the Willamette-Pacific Railroad company that the company has appealed to the supreme court from a decision of the circuit court for Lane county requiring the company to build about 12 miles of highway along the north bank of the Siuslaw river. Action was brought before the service commission by the Lane county court and from the commission's order the company appealed to the circuit court which upheld the commission. It is alleged that when the railroad company built its line along the Siuslaw it appropriated about 12 miles of highway, leaving residents of the district without a wagon road.

Enjoiners of Warrenite Road Lose.

Okmulgee, Okla.—Judge Higgins, of McAlester, holding court in Okmulgee decided in favor of the contract and defendants a suit brought by certain taxpayers to enjoin the carrying out of a contract awarded in December, 1917, for the laying of fifty-five miles of Warrenite road and grading and draining of sixty-three miles additional. The taxpayers voted a bond issue of $800,000 for the improvement, and the bonds were sold at a premium of $40,000 in the year 1917. The contract was let under plans and specifications prepared by Harrington, Howard and Ash, consulting engineers, of Kansas City, Mo., and the contract for Warrenite to be laid on a compressed stone base was awarded to the Western Paving Co., of Oklahoma City, Okla. The plaintiff raised and stubbornly fought every possible statutory jurisdictional and practical question. Depositions were taken in all sections of the United States, and a large number of experts on both sides gave oral testimony at the trial, which lasted ten days, including several evening sessions. At the conclusion, judge Higgins from the bench decided against every point raised by the plaintiff, and denied the injunction for which the plaintiff asked. The roads to be improved connect the cities of Okmulgee, Henryetta, Morris, Beggs, and the surrounding country, which is rich in oil, coal, grazing, and agricultural resources. The heavy traffic accompanying the recent development of these important resources has made the dirt roads nearly impassable.

Big County Bond Issue Carried.

Meadville, Pa.—By almost a two to one vote, Crawford county voters approved a bond issue of $800,000 for improvement of the county's highways at the recent primary election. While the vote was light the issue carried in all parts of the county.

SEWERAGE AND SANITATION

Beautifying Sewage Disposal Plant.

Albany, N. Y.—Under the direction of Philip Bender, superintendent of parks, the city is beautifying the grounds around the sewage disposal plant on Westerlo island. Workmen have been setting out hundreds of Norway maple trees on the grounds surrounding the plant, ivy is being planted around the buildings and beds of shrubs are being set out in various places for the purpose of making the grounds attractive. The idea of improving the grounds originated in city engineer Lanagan's office, and after the subject had been talked over with Charles D. Lay, consulting landscape architect employed by the city, the park department was asked to do the work. With little cost to the city, Mr. Lanagan says, the grounds are being transformed into a place of which the city may well feel proud. "It is one of the public works of the city," said Mr. Lanagan recently' "and it should be placed in such condition as would set a good example for private business plants." The main feature of the improvements that are being made at the plant will be a sunken garden of roses near that part of the grounds where the grit chamber is located. Grass seed has been sown on the embankments and in other places about the plant. "People have had a mistaken idea of what the sewage disposal plant was, and we propose to make it a place that they will visit," said city engineer Lanagan.

Reducing Typhoid in North Carolina.

Raleigh, N. C.—For the four year period including 1914, 1915, 1916, 1917, the death rate in North Carolina from typhoid fever was 30.3. The total number occurring in the state during the four years was 2,909. Due to an energetic educational campaign that has resulted in a general improvement of sanitary conditions throughout the state, and in the immunizing of a large number through the administering of typhoid vaccine, the number of deaths occurring has been reduced each year of the period, falling from 839 in 1914 to 626 in 1917. The death rate from this cause is still very high, and the state board of health is this year undertaking a statewide campaign for the prevention of typhoid epidemics. Not more than 500 deaths in North Carolina in 1918 from typhoid is the goal set, and all the energies of the board will be centered on achieving that result. For the four year period Ashe county leads the state with the lowest death rate from this cause, it being 7.3. Jones county is a close second with a rate of 8.3. Martin county has the misfortune to have the worst record of the 100 counties, having a death rate of 61, with

Perquimans and Lee both crowding it for the place at the bottom of the list with rates of 60.2 and 59.2 respectively. There are 42 counties in which the death rate from this cause is above the death rate for the state as a whole. Included among these are Mecklenburg. Guilford, Forsyth, Wake and Durham counties, which contain five of the largest cities in the state. On the other hand, Buncombe and New Hanover counties, containing the large cities of Asheville and Wilmington, are each well under the state average. In the campaign for the prevention of typhoid fever in the state this year the state board of health will stress three things: The installation of sanitary privies to replace the open back privy which is the favorite breeding place of flies; the destruction of the germ carriers, flies, by destroying their breeding places and screening against their entry into homes; vaccination through local agencies in each county of as many people as can be reached during the year.

City Protests Against Higher Sewerage Rates.

Burlington, N. J.—The Burlington Sewerage Company, taking immediate advantage of the recent ruling of the state public utility commission, by which its franchise is practically called a "scrap of paper," issued bills with an increase of $4 on minimum rates. The increased rate is charged for the last three years, although bills presented during that period have been paid. The minimum rate provided in the franchise was $6. Common council of the city has decided to carry the fight on the new rates to the highest court and has issued a notice to property owners to pay no attention to the new bills. The city has appealed to the Court of Errors and Appeals the recent decision of the supreme court which set aside an order of the public utility commission refusing to grant increased rates to the Burlington Sewerage Company. After the refusal of the commission, the sewerage company appealed to the Supreme Court, which ordered the commission to grant the rates asked for, which was done. In the appeal Burlington declares that the utility commission is without jurisdiction to either increase rates or to grant permission to file new schedules beyond the maximum of rates for service by the sewerage company as fixed in the franchise granted to it, and that the Legislature in 1911 empowered Burlington to fix the maximum rates to be charged by the sewerage company but which have now been set aside.

WATER SUPPLY

Raise Unmetered Rates 25 Per Cent.

Niagara Falls, N. Y.—An increase of 25 per cent. in the city's charge for unmetered water service has become effective and no more applications for unmetered service will be received hereafter. Changes in the schedule of meter rates will become effective July 1st. The new meter rates will be as follows: Less than 20,000 cu. ft. per quarter, eight cents per hundred cu. ft.; 20,000 to 40,000 cu. ft. per quarter, seven cents per hundred cu. ft.; 40,000 to 60,000 cu. ft. per quarter, 6¼ cents per hundred cu. ft.; 60,000 to 80,000 cu. ft. per quarter, 5½ cents per hundred; 80,000 to 100,000 cu. ft. per quarter, 4¾ cents per hundred cu. ft.; 100,000 to 250,000 cu. ft. per quarter, 4 cents per hundred cu. ft.; over 250,000 cu. ft. per quarter, 3 cents per hundred cu. ft. The minimum meter rate will be $1.50 per meter per quarter.

New Filtration Plant Must Replace Old One.

Geneva, O.—Dr. F. C. Smith, village health officer, has received the following letter from state commissioner of health A. W. Freeman:

On May 16 one of our assistant engineers visited Geneva for the purpose of investigating the condition of the public water supply and water purification plant, and of conferring with the officials of the village regarding improvements.

The water purification plant of Geneva, which was installed in 1902, is one of the oldest operating plants in Ohio. In fact, only three other plants now in operation existed at the time the Geneva plant was installed, and of these two will soon be improved or replaced.

The Geneva plant does not meet the modern standard of design, and is unable to produce satisfactory efficiency in the treatment of the water supply. At the time of the visit it was observed that the filtered water contained a noticeable turbidity, indicating unsatisfactory sanitary quality. Turbidity was also observed in the distributing reservoir and to a somewhat lessened extent in the distributing system.

Although no samples were collected these observations indicated that the effluent of the plant was of unsafe quality, and this department would advise that a warning be issued to consumers to boil all water used for drinking purposes until improvements can be made to insure the delivery of a safe supply.

It is obvious that immediate steps should be taken to provide a new water purification plant. This department is of the opinion that it would be unwise to attempt to repair or extend the present purification devices, and that their abandonment and substitution by a new installation is necessary. We would recommend that plans for the necessary improvements be prepared with the assistance of a competent consulting engineer, such plans to be in accordance with the desires of the village officials and the requirements of the State Department of Health.

This department will be prepared to discuss informally the question of the design of the plant in advance of the formal submission of plans for our approval. After the probable cost of the improvement is determined the council should take action to provide the necessary funds and a contract should be awarded. Owing to the urgency for the improvement of the water supply it is advisable that this matter be given consideration without unnecessary delay.

Approaching Complete Metering.

Spokane, Wash.—Leaving only about three thousand unmetered water services in the city, and increasing the total of metered services to 19,456, the city water division installed 620 new meters during April, according to a report by water superintendent Alex Lindsay. In 1910 only 9.18 per cent of the water services in the city were metered. At the end of 1917 the percentage of metered services was 70.63 per cent. During this seven-year period the water consumption per capita of the city's people, based on the government's estimate as to Spokane's population, was reduced from 314 gallons each day to 137 gallons per day.

FIRE AND POLICE

Shake-Up in Police Force.

Richmond, Va.—Investigation by mayor Ainslie of charges and reports to the effect that certain members of the police department were in collusion with the illicit liquor traffic culminated in the removal of chief of police R. B. Sowell from office and the appointment of captain C. A. Sherry in his place. In a letter to Sowell formally notifying him of his decision, mayor Ainslie made it plain that he did not consider the chief's action had made him guilty of any serious wrongdoing, but his conduct had indicated a clear infirmity of judgment and discretion, and on that account he did not believe him to be the proper man for the head of the department. After taking this action, mayor Ainslie announced that all of the statements made to him by policemen and former policemen bearing on the case would be turned over to the Commonwealth's attorney for presentation to the grand jury. Before removing chief Sowell, mayor Ainslie asked for his resignation, but Sowell refused to comply with his request. The mayor said that he then felt it his reluctant duty to put another man in his place. Chief Sowell had been on the force for twenty-six years, and is said to have never had a charge against him before. His removal will debar him from benefits of the Police Benefit Association.

River on Fire—Firemen Save Munitions.

Kearny, N. J.—Only after a vigorous fight did firemen from Kearny and Newark succeed in putting out a difficult blaze in which the Passaic river was literally on fire, which threatened several big warehouses, including one filled with munitions. A watchman in charge of some barges in the Passaic river near Kearny was startled in early morning when he saw "the river catch fire" and begin to burn brightly within a few hundred feet of the barge on which he was located. The blaze raced across the surface of the river to the barge on which he was standing accompanied by flame and superheated air which singed his hair and scorched his face before he could run to land. He turned in a fire alarm on shore near the spot, and when he looked at the river again two barges were ablaze, and the huge patch of fire on the water was increasing in area, although it had lost the speed which originally carried it along. The fire burned the hawser ropes of two work barges, each equipped with derricks and with two scows. They floated into the river ablaze,

and drifted slowly down steam until they lodged against the Pennsylvania freight bridge across the Passaic river near Kearny, setting fire to some piles and ties in the structure, which was built mainly of concrete and steel. Those who saw the strange sight before the firemen arrived diagnosed it as a blaze of mixed chemicals and gases on the surface of the water. The river is the receptacle for the waste of many industrial plants, and often accumulates a thick film of oils, creosote, sawdust, and refuse of various sorts, overhung with a collection of mixed gases from chemicals. When the tide sets inshore the river takes on its thickest coat of combustibles. The watchman said that the blaze seemed to start in midstream, out of reach of sparks from chimneys, so that the original blaze may have been spontaneous. When the Kearny fire department arrived, joined later by apparatus from Newark, they put out the fire where it had reached wooden wharf structures and started to fight the blaze on the Pennsylvania freight bridge, where they prevented serious damage. Chief Charles Greenfield, of the Kearny department, commandeered two fireboats which were undergoing repairs some distance from the fire, and used them to save the remains of the barges. In the meantime the fire continued to burn on the surface of the river, and no attack was made on it, as no method was known for stopping a blaze of this novel character. Shortly after daybreak, however, the fire-fighters got a scare when they saw the fire fed by the scum on the stream eating its way slowly toward a part of the shore on which a storehouse of the American Can Company and a lumber yard were situated. The storehouse was known to be filled with munitions, some of which were believed to be explosive. Most of the fire apparatus was shifted to play on these threatened spots. The floating blaze advanced slowly toward the lumber yard and storehouse for about an hour, then suddenly halted and began to retreat. The tide had suddenly turned and was carrying it in the other direction. After that the area of fire slowly contracted, finally began to flicker, and died out.

Surrounding Towns Help Fight Lumber Blaze.

Minden, La.—The Minden Lumber Company's plant, dry kilns and lumber in the yards were almost completely destroyed by fire, with a loss estimated at from $300,000 to $400,000. The fire started in the sawmill, and spread to the dry kilns and the yards. The flames raged from about 9 p. m. until midnight, when they were gotten under control, but not extinguished. The fire department, mill fire apparatus, the help of hundreds of citizens, and the aid of fire apparatus from surrounding towns joined in the fight on the conflagration. The Shreveport fire department sent a wagon and pumping apparatus with ten men under direction of captain Sawyer over the Cotton Belt railroad. The tramway was cut in half in an effort to stop the flames. Hundreds of men worked futilely to clear stacks of lumber away in time to stop the spread of the fire. The plant was one of the best equipped in the state, and employed several hundred men. No one was hurt.

Seven Firemen Hurt in Aeroplane Factory Blaze.

San Francisco, Cal.—A big fire resulted in a loss of nearly $1,000,000 in the Mission district when flames swept through the plant of the Fowler Aeroplane Corporation and reduced three other factories and nine flat buildings to ashes. About 175 persons were driven from their homes. The cause of the fire could not be determined. From a government viewpoint the most serious loss was the burning of ten aeroplanes ready for shipment to United States flying schools. The planes were valued at about $120,000. Still more serious was the blow to the government aviation program resulting from the loss of thousands of feet of the precious spruce timber used exclusively in the most vital parts of the aeroplane. Within an hour after the fire broke out the government had taken charge. As nearly as could be determined the fire began on the top floor of a showcase factory adjoining the aeroplane factory. Before the first of fire apparatus appeared the showcase plant was in full blaze, fanned by a strong northwest breeze. A freak change of the breeze shot a bank of flame toward the aeroplane factory, and in less than a minute the plant was in flames. So quickly did the flames spread that the plants of two other showcase factories together with a row of nine flats seemed to break into flames simultaneously. Second and third alarms were rung in, and fire chief Thomas R. Murphy assumed personal charge of the fire fighting. The chief was burned about the face, and six other firemen were injured by flames and falling timbers.

GOVERNMENT AND FINANCE

Women Vote in Unfavorable Commission Election.

Poughkeepsie, N. Y.—At a special election the proposition to adopt the plan "C" commission form of city government was defeated by a majority of 170. There were 1,635 votes cast in favor of the plan and 1,805 against. About 600 women voted.

City Employees Get Higher Salaries.

Pekin, Ill.—The petition of the city employees for an increase in salaries has been granted by the city council. The policemen will get $10 per month more, and the firemen, chief of police, city clerk, corporation counsel and city treasurer will get an increase of $15 per month. The salary of the call firemen will remain the same, but two more will be appointed. The increase for the street railway employees will be taken care of in a separate resolution. The salaries fixed by the new ordinance are as follows: Chief of police, $1,200; city treasurer, $1,400; city clerk, $1,200; chief of fire department, $1,200; corporation counsel, $1,320; superintendent of streets, $1,080; policemen, $960; firemen, $960; bridge tenders, $750. The increase in salaries will mean an additional expenditure of about $5,000.

Manager Reed of San Jose Resigns.

San Jose, Cal.—Thomas H. Reed, who has been city manager for two years, has resigned. Manager Reed had previously been a professor of economics at the University of California, and had maintained a bureau of municipal experts. He had been employed, by public subscription, to draft a city manager charter for the city, for which he received $1,000. When the voters approved the charter the council selected Reed as manager at a salary of $6,000 a year. The immediate circumstances preceding the resignation were the small majority, 3,352 to 3,211, given against an ordinance which would have limited candidates for the managership to those with a five years' residence qualification. This was opposed by manager Reed. The administration's request for a increase of 15 cents in taxes was voted down, and a measure to increase the salaries of policemen and firemen, opposed by the administration, was approved by the voters. The city manager's resignation was accepted to take place on or before August 1, 1918, and he was granted a fifteen-day leave of absence, dating from May 31. The city engineer, assisted from time to time by the individual members of the council, will transact the business of the city manager's office in his absence. In his letter of resignation, manager Reed says:

> My primary motive in accepting the position of city manager was to play a part in the establishment of the city manager form of government in this country. I have now seen the success of the city manager form of government demonstrated by its accomplishments in San Jose, and doubly proved by the persistent opposition of those political elements whose control of this city it has effectually displaced.
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> No man has ever been so fortunate as to lead in the moral cleansing or political regeneration of any community without becoming a shining mark for ridicule, abuse and misrepresentation. I expected nothing else, and I would be prepared to go on with the struggle here indefinitely were it not that circumstances beyond the control of the manager and council have made it certain that further sacrifice on my part would be futile for reasons fully explained in the accompanying statement. Furthermore, continued controversy with my fellow citizens is peculiarly intolerable to me in the critical situation in which our beloved country now stands. I have, therefore, made final arrangements to return to the University of California and to take up actively again the practice of law with my former associates, the firm of Haven & Athern in San Francisco.
>
> The issues of the five-year ordinance having now been favorably decided, and with the full assurance of the continued support of the majority of the council, I feel that I am now free to follow my own interests in this matter.

In a statement of the situation of finances accompanying the resignation, manager Reed says in part:

The past two years have given ample proof of the validity of the principles underlying the charter of the city of San Jose. Centralized power and responsibility, modern financial methods and the merit system of appointment have produced, as was expected by the advocates of the new charter, an honest and economical administration free from the taint of partisanship.

The work of the health department has been made vastly more effective than ever before in the history of the city. Even the strongest critics of the administration admit that the fire department is better than it has ever been, and the results in the low percentage of loss from fire prove this fact beyond the peradventure of doubt. Our parks, streets and buildings have been maintained in an improved condition, and may be favorably compared with any period in the past.

The methods of the police department have been modernized. The city is now in a cleaner condition morally than ever before. We no longer have a single open house of prostitution, and our last saloon has gone.

Public utilities, especially the street railway company, have been brought to fulfill all their obligations to the city. Upwards of $12,000 has been expended upon permanent public improvements, especially the filter at Alum Rock park bathhouse, the concrete culvert under Pierce avenue and Orchard street, and the Willow street bridge without increase of indebtedness. An almost equal sum has been expended upon permanent equipment in the fire department.

The indebtedness of the city is less and the tax rate less than it was two years ago. The fact that $23,000 clear balance existed in the treasury December 1, 1917, a situation previously unheard of, demonstrates that economy has kept pace with energy in the present administration. Whatever financial emergency arises in the future can be met in the light of the full facts supplied by our modern accounting system instead of groping in the dark as would have been the case under the old methods.

After referring to the increased costs of operations and salaries due to the war the statement continues:

Not only have we had to face the conditions produced by the war, which affect the city as they do every other business concern, but the people of the city of San Jose have imposed upon us other difficulties for which the city administration is no wise responsible. On the 1st of January by reason of a popular decision, which I, myself, consider to have been wise, saloons ceased to exist in San Jose. San Jose is undoubtedly a cleaner and better city as a result. The benefits of the no-saloon policy, however, have not found their way into the city treasury, and we are running the city this year upon a revenue $40,000 less than last year because of this change. For this year this loss of revenue has in part been taken care of by the $23,000 balance resulting from our economy and care of the year preceding.

By the election of the 6th of May the people voted additional increases to the policemen and firemen, aggregating $785 a month, or $9,420 a year, upwards of $5,000 for the balance of this fiscal year. If, as should be done in order to preserve the efficiency of the departments, the pay of older employees and superior officers is correspondingly scaled up the incre s per annum will total nearer $15,000. At the same time that these obligatory increases of pay were adopted the people voted down the proposition to increase the taxes by 15 cents.

The situation thus created stands as follows: The budget for this fiscal year was narrowly and carefully figured, and the auditor's report, which is presented to the council tonight, shows that we are running very close to the narrow line of safety which it left. There is nothing about the situation presented by this report which need be alarming for this fiscal year were it not for the obligatory increases in pay. We are still within the proportion of our appropriations, and the revenues promise to be practically 100 per cent. There is, however, no margin out of which the increases of pay can be provided, and when the fiscal year begins there will be no material balance, and the full effect of the $40,000 loss of revenue will be felt.

There are two ways in which the situation created by the votes of the people can be met. The first of these is by reducing the expenditures, which means that the city must discharge employees or refrain from doing work that has been contemplated.

The total current expense budget of the city is only about $312,000, and such action must be drastic indeed to make up nearly one-sixth of that amount—$40,000 loss of revenue and $10,000 of obligatory expenses.

The other method of meeting the situation is by an increase of income. All possibility of such an increase by taxation has been eliminated by vote of the people. The only recourse open that can help this or next year's situation is a system such as obtains in Fresno of business licenses levied upon the merchants and other business men of the city. Either course will bring criticism that will be unjust because it will be undeserved. You will necessarily be involved in a kind of controversy especially irritating to broad-minded, patriotic men in this hour of the nation's supreme emergency. Into this situation you have been forced by the indifference of the public and the machinations of a few selfish politicians who need assume no responsibility for their conduct.

TRAFFIC AND TRANSPORTATION

Commission Turns Down City's 3-Cent Fare Request.

Hoboken, N. J.—The state board of public utilities commissioners at Trenton recently dismissed the request of the city of Hoboken, which was filed on March 26, 1913, asking that the fare of the Public Service Railway there be reduced from 5 cents to 3 cents. The original petition applied to only two lines, but on October 1, 1915, an amended petition was filed making the petition applicable also to other lines in the city. The petition alleged that the 5-cent rate of fare was unjust and unreasonable, and that a 3-cent rate would be just and reasonable. After declaring that the city of Hoboken failed to sustain its allegations the report of the board says: "A satisfactory conclusion even after a complete analysis of the testimony is impossible because of the confused state in which it was presented. Much of the testimony offered by various witnesses was subsequently withdrawn because of inaccuracy. Many of the elements necessary to a proper appraisal were disregarded, and it would seem that no genuine attempt had been made by any of the witnesses to ascertain any proper allocation of the passengers, revenue therefrom, or operating expenses to the city of Hoboken which would justify the board in making any determination as to the merits of the application."

Six-Cent Fare Change Postponed—Cities Fight.

Albany, N. Y.—The Public Service Commission for the Second District has ordered the suspension of the operation of the tariff schedule of the United Traction Company which was filed with the commission on May 2. The commission's order directs the suspension of the new rates until Sept. 29, and it will order a hearing concerning the proposed increased fares. The new schedule provided that a rate of 6 cents was to be charged for one continuous ride between Albany and Rensselaer, and that transfers were only to be issued within the "Albany-Rensselaer Through Zone." The cities have decided to fight the increase. Mayor McIntyre, of Rensselaer, through corporation counsel Ernest L. Boothby, filed an objection to the proposed schedule on the grounds that the rates contained therein, as far as Rensselaer is concerned, were "unlawful, excessive, inequitable and discriminatory." Mayor McIntyre contended that the United Traction Company was prevented, by statutory limitations, from increasing the rate of fare or changing the system now governing the issuance of transfers. Under the regulations which have been in force the rate of fare between points in Albany and Resselaer is fixed at 5 cents, with the privilege of transfer to points within the lines operated in the two municipalities. At a recent conference of officials representing Albany, Rensselaer, Troy, Watervliet, and Cohoes it was decided best to have each city and community affected by the new rate schedule conduct its own case, as the conditions are different.

State "Operation" for Boston Elevated.

Boston, Mass.—Governor McCall has finally signed the much-discussed bill placing the control of the Boston Elevated Railway in the hands of a board of five public trustees, to be appointed by him. According to the law the trustees will have power for ten years to regulate service and maintain a flexible fare system without any supervision from state regulatory bodies. The board will manage and operate the property, adjust rates of fare to cover the cost of service, including specified dividend payments on the company's stock, and make improvements to the property. The trustees may appoint and remove the officers of the company, except the directors. The legislature may terminate the period of state operation at any time after 10 years, on two years' notice. It is provided that the company shall raise $3,000,000 by the sale of preferred stock, $1,000,000 of the proceeds to be used as a reserve fund for fare regulation and $2,000,000 for improvements. The state will have the option of buying the property at any time by assuming the liabilities and reimbursing stockholders for the amount paid in. Dividends on the company's common stock are fixed by the act at 5 per cent during the first two years, 5½ per cent during the next two years, and 6 per cent thereafter, payable quarterly. The dividend rate on this preferred stock is to be fixed by the stockholders voting the issue, but may not exceed 7 per cent (cumulative preferential). The act is to become effective upon its acceptance by the holders of not less than a majority of all the stock of the Boston Elevated Railway and of the leased West End Street Rail-

way, and also upon the filing of a certificate that the entire $3,000,000 above mentioned has been subscribed for and at least 30 per cent paid in cash by each subscriber, and that no dividends have been declared or paid upon common stock since the passage of the act. The vote of the company will constitute an agreement to sell to the state or to any political division thereof, at any time during the period of public operation. The purchase price is to be equal to the cash paid in by stockholders for stock outstanding, and the company's current liabilities are to be assumed. Rates of fare are to be changed by the trustees whenever at the end of a quarter the reserve fund is found to be below 70 per cent or above 130 per cent of the original amount. When the reserve fund is insufficient to meet an operating deficit incurred, the state treasurer shall pay the difference and shall assess it upon the cities and towns in which the company operates.

MISCELLANEOUS

Millionaires Fight Over Zoning Law.

New York, N. Y.—The Board of Estimate has attempted to reverse the recent action of the Board of Standards and Appeals in authorizing Baron William Waldorf Astor to erect a business building on the Astor property on Madison avenue, between Thirty-fifth and Thirty-sixth streets. Representatives of J. P. Morgan and the Murray Hill Association have sought to keep the section restricted to residential use, and recently the committee on city planning and public improvements, of which borough president Frank L. Dowling is chairman, reported in favor of such restriction. Mr. Dowling presented his report denying the petition of Baron Astor, and demanded to know whether or not the Board of Estimate had full jurisdiction over the matter, or whether the action of the Board of Standards and Appeals was final. He explained that his committee is charged with investigation of all applications for changing sections of the city from residential to unrestricted business districts, and is supposed to safeguard the homes of city residents from invasion by garages, factories, mills and generally undesirable neighbors. The borough president said:

"If zoning restrictions imposed by the Board of Estimate can be upset and defied at will by the Board of Standards and Appeals this board might just as well abandon its attitude of jurisdiction over the character of buildings to be erected in various parts of the city. The Board of Estimate has twice disapproved of the application of Baron Astor to invade this residential section in Madison avenue." The borough president suggested that the Board of Estimate sustain his report and refer the matter to the corporation counsel for an opinion as to what steps could be taken to nullify the action of the Board of Standards and Appeals, and this was done. The Board of Standards and Appeals had granted the appeal of Henry W. Taft, who appeared for Lord Astor, for permission to erect a seven-story business building. The only condition imposed was that the architectural and structural treatment of the exterior of the building be in keeping with the present development of Madison avenue. "The plans," said Mr. Taft, "call for a handsome seven-story modern structure, 120 feet in height, which has been approved by the Superintendent of Buildings, and will be used for high-class business purposes. The present residential neighborhood will not be affected any more than it is at present, as practically on all the side streets buildings have been and still are being converted for business occupancy. The question is whether you deprive the city of an ornamental improvement and all the incidental additional revenue for the benefit of an owner across the street." It is expected that the fight between these two powerful interests will result in a legal test of the constitutionality of the law. Since the decision of the Board of Appeals is final in so far as the city authorities are concerned, Mr. Morgan's lawyers must go to the courts for redress. They may raise the question of the authority of the Board of Appeals in the premises because it is the creature of and therefore subordinate to the Board of Estimate, the real governing body of the city of New York. According to the "zone resolution" the Board of Appeals, although removable by the mayor at his pleasure, has the last say in all matters appertaining to the zoning law, provided no change in the map of the city is involved. Lord Astor owns the whole block—Madison avenue frontage is in question. It is bounded by Fifth avenue, Thirty-sixth street, Madison avenue and Thirty-fifth street. He alleges that the value of this plot is greatly reduced owing to the fact of its frontage on Madison avenue being placed in a residence district. He desires to put up a business structure there to take the place of a row of old-fashioned brownstone front dwellings which can no longer be rented profitably. They are said to be boarding and romoing houses not of the highest type. It is generally believed that a determined attack is about to be made on the constitutionality of the whole zoning law on the ground that it is arbitrary and exceeds the police powers of the state in that it takes the control of property away from the rightful owner without due process of law. Friends of the zone law realize that this is its weak spot and had hoped that a test case might be made of a decision by the local authorities involving interests less prominent than Morgan and Astor. In the two years of the existence of the zoning law its constitutionality has never been on trial. Decisions have been rendered by the courts concerning the zoning regulations, but always on points not related to the main issue.

Case Against City Seizing Coal Dismissed.

Lima, O.—The injunction proceedings against the city officials charged with seizing coal from the railroad cars during last winter's famine have been dismissed, with consent of the United States District court for the northern division of Ohio, at Toledo by the Baltimore and Ohio railroad. The railroad was granted a temporary injunction when the case was filed and hearing on its application for a permanent injunction restraining the city from the practices complained of was to have been heard last month. Melvin Light, city solicitor, has been conferring with railroad officials for several months to reach a settlement, with the result that the plaintiffs agreed to dismiss the action. Mayor Bailis Simpson, Oscar Roush, chief of police, John Herboltzheimer, market master, and Julian Pape, assistant market master, were named in the action. The case was an outgrowth of the seizure of forty-eight carloads of coal from the B. & O. yards and from trains. The seizures began early in the winter and continued up until December 13. A few days later the suit was filed and an injunction asked. Most of the seizures were attended by frequent clashes between armed representatives of the city and railroad officials and employes. The first seizure occurred early in October and was only accomplished after a clash in which the city blocked the north and south main lines of the railroad for two hours, tying up a number of trains. Locomotives were commandeered by the city, their crews placed under arrest with orders to operate the engines, and train crews recruited from city officials. In the suit before the U. S. district court, which was heard by Judge John M. Killits, of Toledo, the city officials presented as their defense the intense suffering in Lima due to the lack of coal and the inability of the city to obtain supplies through regular channels. Voluminous correspondence with state and federal fuel dictators in which the coal controllers confessed they were unable to relieve suffering here, was placed on record. In spite of the city's defense, however, the officials were severely censured by the court for "high-handed interference" with interstate commerce. Mayor Simpson has never been able to settle for all the coal seized. Of the forty-eight cars taken, twenty-eight were the property of the railroad, and settlement was easily made. Owners of the other twenty cars, however, have never presented bills, and in the meantime the mayor is holding their money in a special banking account here. The forty-eight cars contained about 2,000 tons of coal, which brought about $18,000 when sold by the city. Present indications are that the city will come out about even on the deal, the coal having been sold at as near the actual cost as it was possible to fix the price without exact prices on each car seized.

NEWS OF THE SOCIETIES

CALENDAR OF MEETINGS.

June 13, 14.—NATIONAL ELECTRIC LIGHT ASSOCIATION. Annual meeting, Hotel Traymore, Atlantic City, N. J. Secretary, T. C. Martin, 33 West 39th St., New York City.

June 11-13.—MAYORS AND OTHER CITY OFFICIALS OF NEW YORK STATE. Annual conference, Newburgh, N. Y. Secretary, William P. Capes, 25 Washington St., Albany, N. Y.

June 19-21.—NATIONAL ASSOCIATION OF COMPTROLLERS AND ACCOUNTING OFFICERS. Annual meeting, Atlantic City, N. J.

June 19, 20.—LEAGUE OF TEXAS MUNICIPALITIES. Sixth annual convention, in cooperation with the Texas Commercial Executives' Association, San Antonio, Tex. Secretary, Edward T. Paxton, University of Texas, Austin, Tex.

June 24-26.—AMERICAN CONCRETE INSTITUTE. Annual meeting, Atlantic City, N. J.

June 25-28.—AMERICAN SOCIETY FOR TESTING MATERIALS. Annual meeting, Atlantic City, N. J. Secretary-treasurer, Edgar Marburg, University of Pennsylvania, Philadelphia, Pa.

June 26-28.—SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION. Annual meeting, Northwestern University, Evanston, Ill.

June 26-28.—AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS. Annual convention, Atlantic City, N. J. Secretary, F. L. Hutchinson, 33 West 39th St., New York City.

American Association of Engineers.

The joint convention of the American Association of Engineers and the Committee on Engineering Co-operation, held at the City Club, Chicago, May 14, with about 150 delegates from national, state and local engineering societies, had for its main subject the service of the engineer in war-time. The association, which has more than 2,500 members, and is composed of civil, electrical, chemical and other engineers, was formed "to raise the standard of ethics of the engineering profession and to promote the economic and social welfare of engineers." It follows non-technical lines.

At the dinner meeting, which followed the day sessions, the following officers were elected: President, W. H. Finley, chief engineer, Chicago & Northwestern Railroad; first vice-president, H. W. Clausen, Chicago; second vice-president, L. K. Skinner, president, L. K. Skinner Engineering Company, Chicago; directors: Harold Almert, J. N. Hatch and J. H. Prior, all of Chicago; T. M. Chapman, Savannah, Ga.; F. K. Bennett, Minneapolis, Minn., and Alexander Potter, New York. Glenn F. Vivian, C. A. Gaensslen and J. T. Mullen were elected members of the national auditing board.

Following the opening address by the president, Edmund T. Perkins, and the address of welcome by John E. Ericson, city engineer of Chicago, the meeting was divided into five sections, which held simultaneous sessions during the morning and submitted resolutions for consideration by the meeting as a whole during the afternoon session. These sections, with their chairmen, were as follows: Work of engineering societies and the licensing of engineers, W. D. Gerber; publicity given to the profession by its activities in the war, Fred R. Low, the editor of "Power"; engineering employment and the supply of technical men for war work, W. H. Finley; engineers' assistance in distribution and conservation of coal, G. W. Heald; standardizing engineering education, Professor R. C. Yeoman.

Besides the several resolutions there was presented a summary of returns from sixty-three engineering societies with a total membership of 30,920, to which had been submitted a questionnaire. The returns indicated that the number of engineers in active military service represents 15 per cent.; that 10 per cent. still desire to enter military service, and that 50 per cent. are available for emergency government work. The general opinion is that the status of the engineer will be better after the war; that the demand at present is primarily for engineers in positions below that of assistant engineer, many war industries suffering from lack of this class of men. It was the sentiment of all societies that the technical profession is paid 50 to 75 per cent. too low. Generally the societies favored licensing engineers, especially if license laws are made uniform and the laws be just. They were unanimous in opposing a shorter course in engineering training, an exception being that shorter courses might be allowed for those desiring to enter war service. The majority of the societies favored standardizing engineering courses so as to obtain uniformity throughout the country, although individual specialization should not be interfered with.

In the afternoon there was a warm debate on the projected organization of the American Academy of Engineers, the plan of which is set forth by a bill which has passed the senate and is before the house of representatives. The association made the project one of the subjects of its first referendum ballot and the academy was disapproved by an overwhelming vote. J. A. L. Waddell, one of the projectors of the plan, was to have presented a paper on the subject, but was not present, and his paper, a defense of the proposed academy, was read by Hunter McDonald, of Nashville, Tenn., the latter being one of the few named as charter members of the academy. Much opposition was voiced, and but little said in favor, but no action was taken other than deciding to take the referendum vote over again for the reason that the first ballot had not stated both sides of the case. The academy as projected will have only 200 members, and the proposition was characterized as creating a caste of engineers, as undemocratic and as un-American.

Organization and co-operation were considered mainly in regard to engineering societies. National organization of engineers was the subject of

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PROBLEMS CITIES ARE STUDYING WITH EXPERTS

A big CONCRETE RESERVOIR is to be built by Perth Amboy, N. J. The engineer for the improvement is George A. Johnson.

Scobey, Mont., is to build WATERWORKS, plans for the improvement having been completed by the engineer, W. B. Saunders.

Santa Cruz County, Cal., is to build LEVEES to protect Watsonville City. The engineers for the work are the firm of Haviland & Tibbetts.

Dallas, Tex., confronted by a number of difficult and urgent TRAFFIC and TRANSPORTATION problems, has retained John A. Beeler as expert to investigate and report on improvements.

WATERWORKS IMPROVEMENTS, including a reservoir and a filtration plant, are to be made by Highland Park, Mich. The consulting engineers for the work are the firm of Hoad & Decker.

A WATER SUPPLY SYSTEM is to be built by Poteau, Okla. The engineer for the work is H. A. Pressey.

Bonds have been voted by Newcastle, Wyo., for a WATERWORKS SYSTEM, plans for which are being prepared by the engineer, R. D. Salisbury.

West Virginia is to build a SEWAGE TREATMENT PLANT at its state hospital at Weston. The consulting engineer for the improvement is C. E. Collins.

The municipality of Lima, Peru, has retained George C. Bunker, in charge of water purification for the Panama Canal, to investigate the WATER SUPPLIES now in use and those available for future use.

The Port Commissioners of New Orleans, La., are to build LOCKS to connect the Mississippi river with the proposed industrial CANAL. The engineering firm of George W. Goethals & Co. is planning the development.

INDUSTRIAL NEWS

Cast Iron Pipe.—The new government prices announced recently are now being quoted and will probably remain effective. Quotations: Chicago: 4-inch, $63.35; 6-inch and larger, $60.35; Class A $1 extra. Birmingham: 4-inch, $58; 6-inch and larger, $55; Class A $1 extra. New York: 4-inch, $64.35; 6-inch and larger, $61.35; Class A $1 extra.

Army Orders 8,000 More Trucks.—Orders for 8,000 motor trucks for the use of the United States army have just been placed by the Motor Transport Service. These trucks, designated as "Class B Standard," will have a capacity of from three to five tons. They will be distributed as needed through the various branches of the army. Ten thousand of these Class B standardized trucks have previously been ordered and are now in process of manufacture and delivery.

Sixteen companies are expected to share the order, fifteen having already signed contracts. They are: Gramm-Bernstein Motor Truck Co., Lima, O.; Kelly-Springfield Motor Truck Co., Springfield, O.; Indiana Truck Corporation, Marion, Ind.; Service Motor Truck Co., Wabash, Ind.; Republic Motor Truck Co., Alma, Mich.; Selden Truck Co., Rochester, N. Y.; Bethlehem Motor Corporation, Allentown, Pa.; Diamond T. Motor Co., Chicago, Ill.; United States Motor Truck Co., Cincinnati, O.; Brockway Motor Truck Co., Cortland, N. Y.; Healy Motor Corporation, Moline, Ill.; Sterling Motor Truck Co., Milwaukee, Wis.; Garford Motor Truck Co., Lima, O.; Packard Motor Truck Co., Detroit, Mich., and Hurlbert Motor Truck Co., New York City.

These companies will do assembling work chiefly, parts having been ordered from other concerns, and will receive an assembling price of $567 per truck. They are to complete deliveries between August 1 and December 1.

Indiana Limestone Production in 1917.—The total value of Indiana oolitic limestone sold in 1917 was $3,384,110, a decrease of $96,415, or nearly 3 per cent, compared with 1915, according to figures compiled under the direction of G. F. Loughlin, United States Geological Survey, Department of the Interior, in co-operation with the Indiana Limestone Quarrymen's Association. This value, however, was greater than that for any preceding year except 1912.

Almost the entire value in 1917, as in previous years, was represented by building stone.

The total quantity of building stone sold in 1917 was 6,570,645 cubic feet, valued at $3,261,107, a decrease, compared with 1916, of 23 per cent in quantity and nearly 4 per cent in value, the average price increasing from 40 to 50 cents a cubic foot. Rough blocks and rough sawed stone amounted to 4,806,850 cubic feet, valued at $1,631,297 in 1917, a decrease of about 18 per cent in quantity, but an increase of 19 per cent in value, the price per cubic foot rising from 23 to 34 cents. Dressed or manufactured stone amounting to 1,763,795 cubic feet, valued at $1,629,810, decreased 34 per cent in quantity and nearly 20 per cent in value, the price per cubic foot increasing from 75 to 92 cents.

Crushed stone, mostly for road metal, came largely from the Mitchell limestone, which overlies the oolitic stone, and amounted in 1917 to 93,086 short tons, valued at $62,698, and fluxing stone amounted to 47,439 short tons, valued at $10,163. These, with smaller quantities of riprap and stone sold to sugar factories, glass factories and for agricultural use, reached a total of 210,326 short tons, valued at $123,003, a decrease in quantity of 0.9 per cent, but an increase in value of 41 per cent, the average price per ton rising from 41 to 58 cents.

NEWS OF THE SOCIETIES

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several plans presented by Gardner S. Williams, consulting engineer, Ann Arbor, Mich., C. E. Drayer of the Committee on Cooperation, and by Hunter McDonald, chief engineer of the Nashville, Chattanooga & St. Louis Ry.

Universal military training was indorsed. Employment of technical men for government service through the free "Public Service Reserve" established by the United States Department of Labor was urged.

Desirability of the establishment of a code of ethics was brought up in a letter from Morris L. Cooke, Philadelphia, and Isham Randolph was requested to prepare such a code.

Society for Electrical Development.

The annual meeting of the Society for Electrical Development, Inc., was held May 14 at the offices of the society in New York City, James R. Strong presiding. General manager Wakeman read his annual report, reviewing the work of the society during the past year and suggesting activities for the coming year. The following officers were elected: For directors to represent central-station interests—J. E. Montague, four years; W. W. Freeman, two years; E. N. Sanderson, one year. For directors to represent manufacturing interests—L. P. Sawyer, four years; W. D. Steele, one year. For director to represent jobbing interests—Fred Bissell, four years. For director to represent contracting interests—G. M. Sanborn, four years.

At the board of directors' meeting, which followed the annual meeting, with J. E. Montague presiding, it was decided to continue the work of the society for another year upon the present basis and to conduct a "Convenience Outlet" campaign as suggested by the general manager. An appropriation was made to carry on the campaign along national lines, similar to the "Wire Your Home" and "America's Electrical Christmas" campaigns.

The society will issue broadsides, booklets, folders, lithographed posters, etc., and will ask local committees to procure the co-operation of the entire electrical industry in educating the public to an appreciation of "Convenience Outlets" of all kinds, such outlets to be preferably on a separate circuit from the lighting. It is felt that the time is opportune for such a campaign, when domestic servants are scarce and people have money to spend upon appliances, the proper use of which plays an important part in fuel conservation.

Henry L. Doherty was again elected president. Joseph E. Montague was elected to succeed W. H. Johnson as vice-president and as a member of the executive committee. Gerard Swope was elected chairman of the executive committee. James W. Wakeman was reappointed general manager, and James Smieton, Jr., secretary-treasurer for the ensuing year.

Southeastern Sanitary Association.

The Southeastern Sanitary Association held its recent meeting at Knoxville, Tenn. The association chose R. L. Carlton, M. D., health officer of Winston-Salem, N. C., as president for the ensuing year and Rome, Ga., for the next annual session in May.

Other officers named were Clarence E. Smith, Greenville, S. C., secretary-treasurer, and vice-presidents, Tennessee, Dr. R. C. Smith, Newport; North Carolina, J. H. Epperson, M. D., Durham; South Carolina, Davis M. Furman, Greenville; Georgia, V. H. Bassett, M. D., Savannah.

The association will hereafter publish an annual bulletin.

Highway Traffic Association of New York.

A public meeting of the Highway Traffic Association, of the State of New York, will be held in the grill room of the Automobile Club of America, 247 West 54th street, New York City, at 8:30 p. m., on Wednesday, June 12.

Gen. Francis V. Greene, George H. Pride, members of the Highways Transport Committee of the Council of National Defense; William A. Bassett, of the Bureau of Municipal Research, of New York City, and Joseph K. Orr, president, New York Team Owner's Association, will speak on the topic, "Should Unnecessary Obstructions and Pavements Full of Holes on New York City's Main Commercial Traffic Streets Be Tolerated During the War?" The addresses will be followed by a general discussion.

Dinner at $1.25 per cover will be served in the grill room at 7 p. m. All are invited to both the dinner and the meeting. Any one wishing to attend the dinner should notify the secretary, Elmer Thompson, 247 West 54th street, New York City.